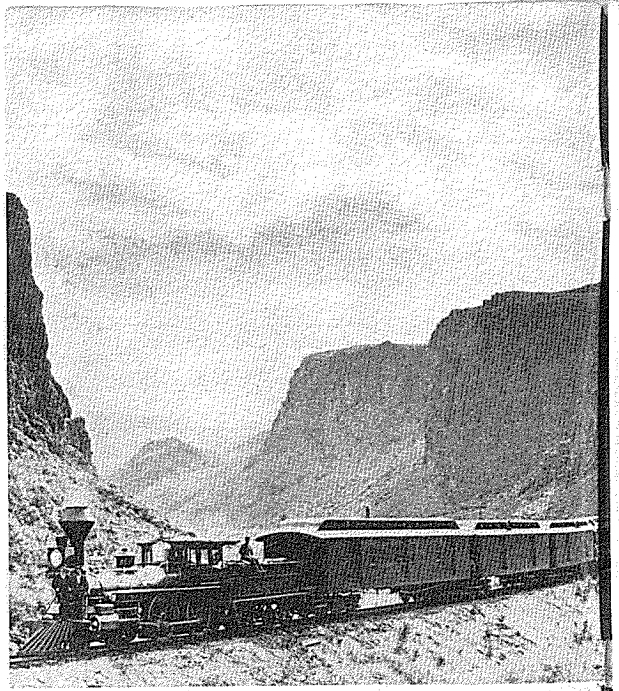
Southern Pacific Bulletin

PACIFIC LINES AUGUST, 1955



CENTRAL PACIFIC TRAIN OF 1870s IN THE NEVADA PALISADES AREA
(COVER: SP's No. 1 "C. P. Huntington" and modern diesel.)

This booklet presents in concise form the history and progressive development of the Southern Pacific Company. The text is a revision and expansion of what appeared in a previous booklet, "75 Years of Progress." The new booklet was compiled by the staff of the railroad's Public Relations Department, 65 Market Street, San Francisco, and published in August, 1955.

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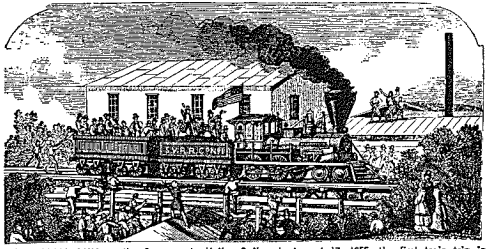


FIRST TRIAL RUN on the Sacramento Valley Railroad, August 17, 1855, the first train trip in the West, was illustrated by this wood-cut engraving published in the Sacramento "Union." Actually, about 200 persons had the distinction of crowding onto three flat cars for the ride of about fourteen city blocks behind the locomotive "Sacramento."

CENTENNIAL

A CENTURY ago the first tracks that are now Southern Pacific were pushing aside the wilderness. Today the West and Southwest that Southern Pacific serves are the most rapidly growing areas in the United States, both in population and in spread of industries.

Southern Pacific has grown to greatness because of the transportation service it has given. It has grown with the West and Southwest it helped build.

This booklet deals mostly with the railroad's eight-states Transportation System whose 13,459 miles of railroad (including 1,054 miles of affiliated lines) extend from Portland, Oregon, to New Orleans, also to Ogden, Utah, and Tucumcari, N. M. Supplementing the rails are 16,902 miles of truck routes. The St. Louis Southwestern Railway (The Cotton Belt), in which SP owns a controlling interest, operates 1,561 miles of railroad and 2,583 miles of truck routes, with principal SP connections at Shreveport, La., Corsicana and Dallas, Tex. SP pipe lines, over 800 miles, were under construction in mid-1955 between Los Angeles and El Paso refineries. In all, SP owns or controls transportation properties located in 12 states.

Some parts of the railroad's system in Texas and Louisiana date

from 1851-52, but it was not until the early '80s that SP's western lines were linked to those in the southwest to complete today's Sunset Route. Centennials of those initial lines in Texas and Louisiana were observed in their respective anniversary years.

Southern Pacific's 1955 Centennial salutes August 9, 1855, the day when the first rails laid on any portion of the company's present western lines were spiked down at Sacramento, California.

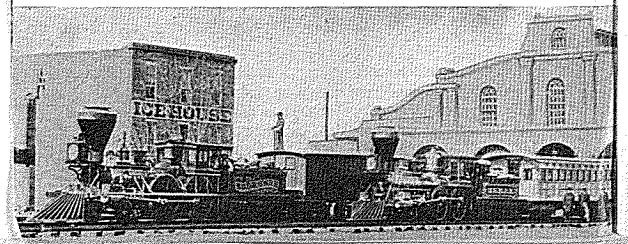
Those rails were for the pioneer Sacramento Valley Railroad, laid out by 28-year-old Theodore D. Judah to serve mining areas in the western foothills of the Sierra Nevada Mountains. On Washington's Birthday, 1856, the railroad, first steam operation in the West, was placed in service 23 miles to Folsom.

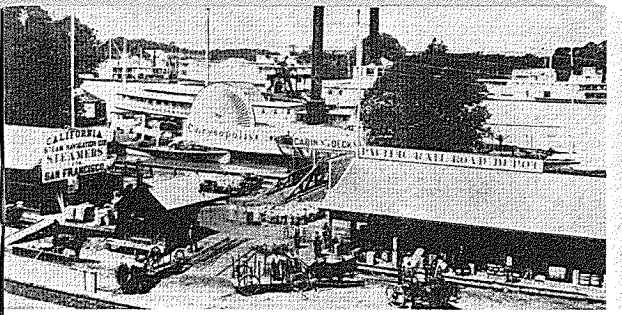
Judah's ambition was to build a transcontinental railroad, not just rails to serve the booming California mines. So he turned his attention to the greater objective. By late 1860 he successfully launched the project that was to become the Central Pacific Rail Road of California, parent of today's Southern Pacific Company.

The Sacramento Valley Railroad promoters experienced financial difficulties in early stages of construction. By 1865 Central Pacific had acquired the property which then also operated from Folsom 18 miles northward to Lincoln and eastward 26 miles to Shingle Springs. Placerville became the terminus in 1888.

This pioneer railroad, distinguished as first in the West and for having lured the illustrious Judah to California, eventually became but a branch line connection to the transcontinental Central Pacific, today's SP route over the Sierra.

PIONEER WOODBURNER "Christopher Adams, Jr.," of the New Orleans, Opelousas & Great Western is shown in this picture taken about 1865 at Algiers, just across the Mississippi River from New Orleans, when properties of the railroad were operated by the U. S. Military Railroad, initials of which appear on the other woodburner. (Picture from collection of Gerald M. Best.)





SACRAMENTO WATERFRONT as it looked in 1868, the year before the first transcontinental railroad was completed. People traveling to the East came up the Sacramento River from San Francisco, boarded trains of the Central Pacific at Sacramento, rode to end of the track then building eastward, and continued the journey by stage coach to mining regions or to the rail-head of the westward building Union Pacific. "Chrysopolis" was one of Sacramento River steamers, some parts of which later saw service in the ferry "Oakland."

Southern Pacific's First Century

"What was it the Engines said,
Pilots touching,—head to head
Facing on the single track,
Half a world behind each back?"

THESE LINES were penned by the immortal Bret Harte heralding that day in May of 1869 when the Central Pacific woodburning locomotive from the West touched its pilot to the Union Pacific coalburner from the East to signal completion of the first transcontinental railroad.

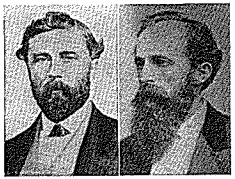
The story of the early beginnings of this great railroad project, and of the pioneer lines in California, Texas and Louisiana that became a part of it, is the story of the West and Southwest. It is the saga of individual initiative and courage that spanned a nation with bands of iron rail and nurtured the development of a vast empire, extending from the Pacific Northwest to the Gulf of Mexico.

Construction of the rail highway for the Iron Horse from the Pacific Coast to the Missouri River during 1863-69 was one of man's greatest triumphs of engineering. Great, too, were the obstacles overcome in the early '50's by the builders of the Buffalo Bayou, Brazos & Colorado in Texas, and the New Orleans, Opelousas & Great Western in Louisiana.

Their completion gave birth to a new era, and the expansion of those lines is evidenced today in the far-flung properties of the Southern Pacific Company.

Pioneer of transcontinental railroads, Southern Pacific had its origin in the Central Pacific Rail Road Company of California, incorporated June 28, 1861, to build the western portion of the Pacific Railroad. Construction began at Sacramento in 1863 following authorization by Congress in 1862.

This historic unit of today's great transportation system was built from



CHIEF ENGINEERS: Theodore D. Judah, left, died six years before line's completion; Samuel S. Montague carried on.

Sacramento 690 miles over the Sierra Nevada Mountains and across Nevada to meet the Union Pacific at Promontory, Utah, where the Gold Spike was driven on May 10, 1869.

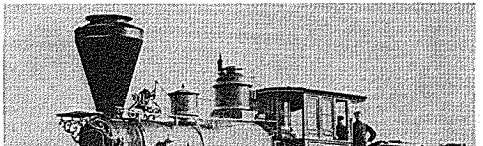
To an unknown editor in the little village of Ann Arbor, Michigan, belongs the credit for making in 1832 the first suggestion for a railroad that would span the continent from the Great Lakes to the Pacific. At that time less than 100 miles of rail lines had been built in the United States during the three years since the first public railroad was operated out of Baltimore.

The benefits of a transcontinental railroad, it seems, should have been obvious to all thinking men, but the idea took root only gradually and met with strenuous opposition. The first plan to receive consideration of Congress was one in 1836. Others followed, some of them having a short route to the rich Orient as the primary objective rather than being aimed at the development of the West.

Discovery of gold in 1848 focused world attention on California and the Pacific Coast region. The arduous overland journey across the plains by oxen or mules, and the long ocean voyage via Panama or around Cape Horn, brought to the early settlers a realization of their isolation from the remainder of the country. A growing sentiment in the West and East favored a railroad that would bind the nation closer together.

During 1853 five parties of Army engineers were sent into the West to make surveys over various routes. Volumes of data were compiled but intense factional rivalries among congressmen

FIRST LOCOMOTIVE of Central Pacific was the locomotive "Governor Stanford," named in honor of Leland Stanford, first president of the railroad. Built in the East and shipped by boat around Cape Horn, the picturesque woodburner was assembled at Sacramento, where the first trip was made on November 10, 1863.



THE BIG FOUR: The men whose courage and determination pushed the western portion of the first transcontinental railroad over the High Sierra to completion were, left to right: Collis P. Huntington, Leland Stanford, Charles Crocker, and Mark Hopkins.

from the North and South frustrated every effort in behalf of a railroad. The Civil War brought needs for definite action. Withdrawal of the southern representatives left official Washington of one accord. It was vital that California and the Pacific Coast be bound to the Union; consequently, the Pacific Railroad became a military necessity.

The Pacific Railroad Act was signed by President Abraham Lincoln on July 1, 1862, and six months later, on January 8, 1863, the first shovelful of earth was turned by Central Pacific in constructing the pioneer line.

Southern Pacific is a monument to the enterprise and vision of Leland Stanford, Collis P. Huntington, Charles Crocker and Mark Hopkins. These Sacramento merchants, famed in later years as the "Big Four," became impressed with plans for a railroad east over the Sierra as conceived by Theodore D. Judah, a young civil engineer.

Typical of the courage and daring that characterized the successful exploits of many western pioneers, the four associates launched the project, unmatched in all the story of rail transportation, without any one of them ever having been remotely connected with a construction project of greater magnitude than the erection of their own store buildings. Against the advice of their friends and in the face of strong opposition and ridicule they threw their entire resources and personal credit into the project. How they accomplished the task is an epic chapter in the history of the West.

Builders Young Men

Stanford, 36 years old when first steps were taken in November, 1860, to organize a railroad company, was a dealer in groceries and provisions; Crocker, 38, had a dry goods store; Huntington, 39, and Hopkins, 47, were partners in a hardware establishment. From this prosaic early environment the two hardware merchants became financial geniuses; the weigher of sugar and tea developed into a master organizer and political leader; while the man who had stood behind a ribbon counter rose to command men in a construction undertaking that startled the engineering world.

Judah was 34 when he brought the "Big Four" together. Six years earlier, the Connecticut-born engineer came to California to build the Sacramento Valley Railroad. He came west eagerly, for he was obsessed with ambition to help build a railroad that would span the nation. In 1856, he completed a 23-mile line between Sacramento and Folsom, the first steam railroad in the Far West, and destined to become the oldest unit of SP's western lines.

But Judah did not remain long with the Sacramento Valley Railroad. His attention was directed toward finding a

CHINESE WORKERS, with but picks and shovels, one-horse dump carts and black powder, carved a way through and over the granite walls of the Sierra for rails of the Central Pacific. This scene was taken above Auburn. During the '60's there were no power tools of the type common in modern construction, no scrapers were available for grading the roadway. Dynamite had been produced but was not in general use.

suitable route eastward over the mountains for the transcontinental railroad of which he dreamed. He became the first advocate of the Pacific Railroad who had practical railroad engineering knowledge to add to sincere enthusiasm. He took his plan to Congress on several occasions, made preliminary surveys over various routes through the Sierra, and had received a small amount of financial support from residents in the mountain towns. But his proposal was branded by many as fantastic or a vicious money-grabbing scheme. He failed to impress men with money to invest until he got the attention of the Sacramento merchants.

Four parties of engineers went into the mountains early in 1861 under Judah's direction. The reports led to incorporation and organization of the Central Pacific. Stanford, to be elected governor of California in September, 1861, was chosen president; Huntington became vice president; Hopkins, treasurer; and Judah, chief engineer. Crocker became one of the directors and was later general superintendent of construction. Judah again went to Washington and played a leading role in final passage of the Pacific Railroad bill. Huntington went to New York to try to raise money. He met with little encouragement for the enterprise seemed too risky; prospects of financial returns were too remote. Even the assurance of government aid through grants of land and the loan of federal money, left the Central Pacific organizers with a formidable task ahead of them. After passage of the bill, Huntington wired his associates: "We have drawn the elephant, now let us see if we can harness him."

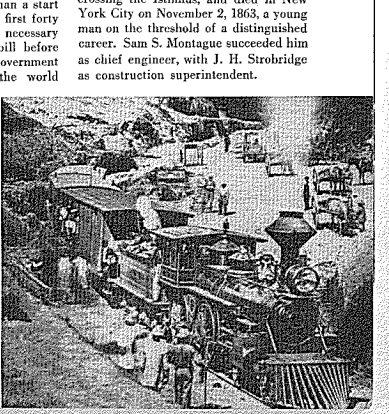
The Job Undertaken

The country to be opened by the railroad was then almost entirely a wilderness. All that was known of the region at that time discouraged such a venture. Mountain roads so steep that covered wagons had to be lowered down them by ropes were still fresh in the minds of emigrants who crossed the plains to settle in the West. Picks and shovels, black powder, wheelbarrows, one-horse dump carts, were the only aids to grading. Cutting a roadway through the rock walls of the Sierra was literally hand carving. There were no power tools of any kind, such as are common on big construction jobs today; even dynamite was not then in general use. Chinese laborers were swung in baskets over cliffs high above the American River to hew a footing so that workers could blast out a grade for the track in the mountain side. Tunnels were dug while the region was covered under snow packs often thirty feet deep. All of the rolling equipment and most of the building materials had to be shipped 15,000 miles around Cape Horn from the East, a voyage of eight to ten months. At one time the Central Pacific had thirty ships on the high seas loaded with materials. White labor was scarce in California, for men were more interested in digging for gold than in working on a railroad. Although each of the four associates was a wealthy man, as wealth was counted in those days, their combined resources were totally inadequate to finance much more than a start in building and equipping the first forty miles of railroad which was necessary under terms of the federal bill before one dollar was available in government bonds. It is little wonder the world doubted this railroad could be built by four inexperienced country merchants in a land that was so lacking in money, men and materials.

Although New York capitalists were not interested in the railroad as an investment, they were impressed with the high credit rating the Sacramento business men held in the commercial world. Thus, by personally guaranteeing the interest on a limited number of Central Pacific bonds for ten years, the four associates raised enough money to start construction on a big scale.

The first rail was laid in Sacramento on October 26, 1863; the first locomotive, "Governor Stanford," went into service November 10, 1863; and the first 31 miles of railroad was in operation to Newcastle on June 10, 1864, when the first timetable was published (four days premature) announcing regular passenger and freight service.

Judah lived only long enough to see construction actually underway on the railroad to which he had been so devoted. He contracted Panama fever while crossing the Isthmus, and died in New York City on November 2, 1863, a young man on the threshold of a distinguished career. Sam S. Montague succeeded him as chief engineer, with J. H. Strobridge as construction superintendent.



WORK TRAIN IN SIERRA during 1865 when grade for the railroad was being cut above Auburn. At one time more than 14,000 men, mostly Chinese working with meager equipment, were engaged in the gigantic project. All locomotives and rail, also most of other equipment and materials for construction were shipped 15,000 miles around Cape Horn.

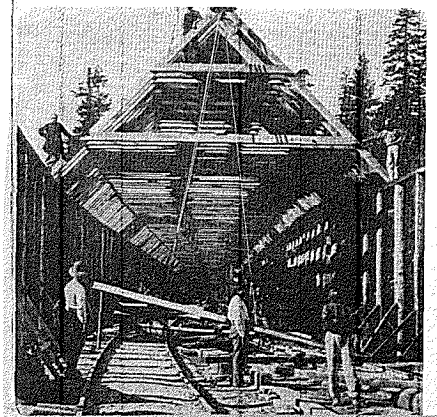
The builders soon faced serious financial difficulties. Money raised by Huntington in New York had been exhausted, mostly in the purchase of equipment and materials and in greatly increased cost of their transport around the Horn due to wartime conditions. Work never came to a complete stop, but there were days on end when there was not one cent in the company's treasury. It was at this time that an appeal was made for public support. The voters of three counties responded favorably, but strong opposing interests threw the bond proposition into court, and it was well into 1865 before the aid was available. Advantage could not be taken of a mild 1864-65 winter in the Sierra; otherwise the Central Pacific might have met the Union Pacific at Cheyenne instead of *Promontory*. Eleven months passed before the five miles between Newcastle and Auburn were opened to traffic May 13, 1865.

Beyond Auburn the forty-mile mark was passed and government bonds loaned the railroad could be turned into cash. There was a clamor for more men, and because of the scarcity of white labor, Crocker experimented with Chinese laborers. The Orientals proved so successful that hundreds were added to the construction gangs.

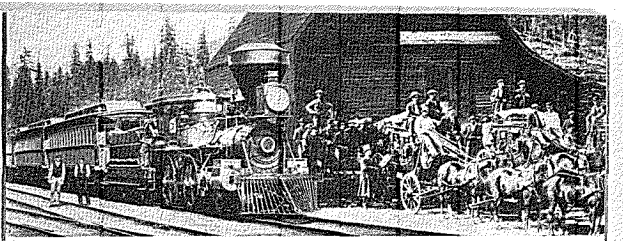
Sierra Battle Begun

The beginning of 1866 saw the fight to overcome the Sierra on in earnest. Crocker decided to work the 1,659-foot Summit tunnel from four faces. A shaft was sunk and crews worked each way from the center while others dug from the entrances. Rock was so hard it took the better part of a year to dig the shaft *deep enough to begin the laterals*, and it was another year from then before the tunnel was completed. Altogether, 15 tunnels were bored through the Sierra.

Working conditions were difficult at all times, but severe winters of 1865-66 and 1866-67 called for superhuman courage to keep things going. During the latter winter the only work possible was in the tunnels. It was during this winter that Crocker directed the tremendous but strategic undertaking of hauling and sledging three locomotives, forty cars, and material for forty miles of track over twenty-eight miles of tortuous mountain trails down into the Truckee River canyon where light snow made grading and track work possible. It was June of 1867 before the forces could be brought back into the mountains, where the grade in many places was still buried under heavy snow packs. By November the road was in operation to Summit station. Again the forces were transferred to the Truckee region. The first locomotive poked its nose over the California-Nevada state line on December 13, 1867, and by the end of the year there remained only a seven-mile gap of difficult construction over the Sierra Summit at an elevation of 7,017 feet, and on the ridges above Donner Lake, to link the Truckee work into a through line.



SNOW SHEDS had to be built in the high Sierra, where 30-foot snow packs were a handicap to Central Pacific construction forces. This picture was taken in 1867. Eventually 40 miles of sheds were erected over tracks in almost a continuous stretch at highest elevations. Today only a few miles of sheds remain, due to use of powerful rotary snow plows and other improved machinery and methods for snow fighting.



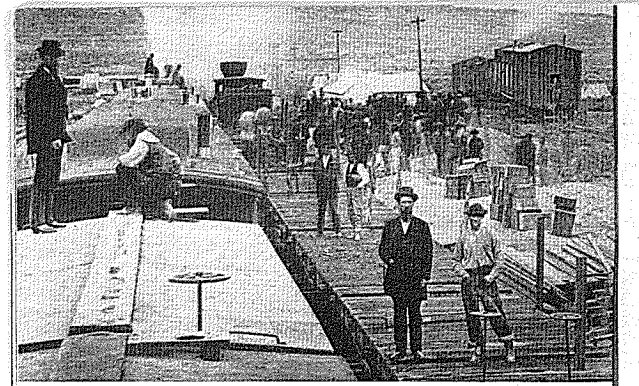
MARCH OF PROGRESS: Cisco in the Sierra in 1867. As the Central Pacific moved its railhead forward in the construction of the first transcontinental railroad, the stage coach, so romantic in Western history, slowly gave way before the advance of the Iron Horse.

First Snowsheds

Difficulties in keeping the line cleared of snow in the high Sierra region convinced the builders that the problem must be solved before trains could be operated successfully, so it was decided to build snowsheds over the tracks. Experimental sheds were erected in the summer of 1867. Construction that started in the spring of 1868 was completed in the fall of 1869. Forty miles of sheds were eventually erected, the nearly solid covering over the tracks once prompting a boomer brakeman to remark: "I've railroaded all over the world, but this is the first time I've ever railroaded in a barn." (Powerful rotary snow plows and improved snowfighting methods gradually reduced the snowshed mileage in succeeding years, and today less than six miles remain.)

The year 1868 was one of feverish activity for the Central Pacific forces. Crocker announced a construction program of a "mile of track every working day," a goal that actually was surpassed. The race with the Union Pacific was on in earnest. Each company was alert to the advantage in future earnings from every additional mile of railroad built. The tough work in solid rock above Donner Lake was completed in the spring of 1868 and the Sierra had been conquered. On June 19 the road was opened to Reno, Nevada, a townsite staked out by the railroad's engineers.

The route ahead was over a terrain that offered none of the difficulties encountered in the mountains. The "mile a day" program went into high gear. Crocker's "pets," as the 14,000 Chinese workers were dubbed, together with some 2000 whites and about 6000 horses, responded with superhuman effort. Canvas towns sprang up to live but a few days as rail-head was pushed steadily



CAMP "VICTORY" as it appeared April 28, 1869, was appropriately named. On that day eight brawny Irishmen, backed by a small army of Chinese and other experienced track builders, laid more than ten miles of rail to establish an all-time track construction record and win a $10,000 wager for their boss, General Supt. Charles Crocker. Job was directed by Construction Supt. J. H. Strobridge, standing left on flat car.

eastward. The rival builders could not agree where their tracks should join and for many miles, far in advance of the track layers, the grading crews often worked within a few yards of each other on parallel lines. The government's railroad commissioners finally ruled that the rails should join in the vicinity of Promontory Summit in the barren, low hills beyond Great Salt Lake in northern Utah.

Ten Miles in One Day

Most intense construction came in the early months of 1869. One day Union Pacific's Irish "terriers" laid six miles of track. Crocker's "pets," paced by Central Pacific's own Irish track builders, followed with seven. This was bettered by the rival camp and brought the boast from Crocker that his men could lay ten miles of track in a day. It is said that his wager of $10,000 was "covered" by Thomas C. Durant, vice president of the Union Pacific. Crocker and Strobridge made careful plans. Ties were laid several miles in advance and materials were hauled ahead to strategic points. April 28, 1869, was the day. While a number of officers of both companies, including Gen. G. M. Dodge, chief engineer of the UP, several newspaper correspondents, and workers from the rival camp looked on, the Central Pacific forces, working with military precision and organization, laid ten miles and 56 feet of track in a little less than twelve hours, a feat that has never been equaled. This day's performance brought the CP rail-head past Camp Victory, later Rozel, a few miles from Promontory.

Last Spike Ceremony

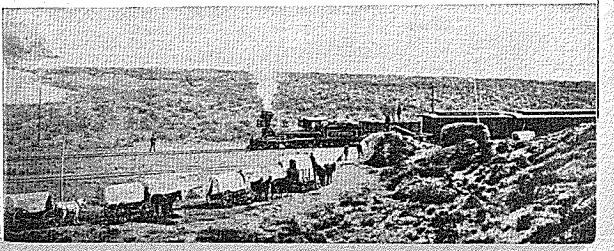
Stanford was the principal instigator of the Last Spike ceremony on May 10, 1869, an historic event that will live forever in the annals of colossal construction achievements. Present were the few hundred workers left to complete the job, four companies of the 21st Infantry and regimental band from nearby Fort Douglas, a sprinkling of settlers, a few officials of the two companies, their guests, and a photographer. On his special train from Sacramento, Stanford brought the famous Gold Spike as a gift from David Hewes of San Francisco, also a highly polished laurel tie, silver sledge-hammer and shovel. Special spikes of precious metals were presented in behalf of other western states. All of these glistening mementoes played an honorary part in the program. Many cities celebrated the occasion, and throughout the nation knots of people gathered around telegraph offices to get the final flash from far-off Utah. Telegraph lines at Promontory were connected to a specially prepared hammer and spike so that Stanford's tapping on the last spike sent a click-click-click over the wires to signal completion of the Pacific Railroad at 12:45 p. m., Promontory time. Central Pacific's bonnet-stacked, woodburning locomotive "Jupiter" and the slim-stacked coal-burning No. 119 of Union Pacific were moved up so their pilots touched, while men climbed aboard to have their pictures taken as the two chief engineers of the gigantic project shook hands heartily.

The gold spike and the silver spike used at the Promontory ceremony, also the silver shovel and sledge hammer, are at Palo Alto, California, in the Stanford Museum. The laurel tie was destroyed in the San Francisco fire of 1906.

The first passenger train from Omaha to Sacramento was run two days later, and on May 15 regular transcontintental freight and passenger service was inaugurated. The first daily passenger train between Sacramento and Omaha was known as the "Atlantic Express" eastbound and the "Pacific Express" westbound. The trip between Sacramento and San Francisco was by river steamer. Connection was made at Omaha with trains for Chicago, St. Louis and eastern points. Passengers completed the 3,167-mile Sacramento-New York trip in seven days flat, the 168-hour schedule of elapsed time not taking into consideration the three hours' variation in time zones that would be effective today. (Standard time was established in United States and Canada on November 18, 1883, prior to which date every railroad ran its trains by the local time of the city in which its headquarters were located, or on some other arbitrary standard.)

No passenger or freight cars operated through from Sacramento to Omaha in early years of the transcontinental road, except for an occasional "de luxe" spe-

ENTER NEW, EXIT OLD: En route to the Last Spike ceremonies, Stanford's special train was met by a forerunner of first transcontinental steam train—a covered wagon caravan westbound with emigrants. Meeting was at Monument Point near Promontory.



FIRST TRANSCONTINENTAL RAILROAD dream is realized as Central Pacific's Jupiter touches Union Pacific's No. 119 in this "Last Spike" ceremony at Promontory, Utah, May 10, 1869. The men in the center shaking hands are the chief engineers of the two lines—S. S. Montague, of Central Pacific, (left), and General G. M. Dodge, Union Pacific.

cial train. During the first few months the line was opened, passengers transferred with their baggage from Central Pacific cars to those of the Union Pacific at Promontory. After Central Pacific purchased 47.5 miles of track the UP had built east of Promontory and leased an additional 5.11 miles, the transfer point and terminal of both companies was established at Ogden.

Silver Palace Sleepers

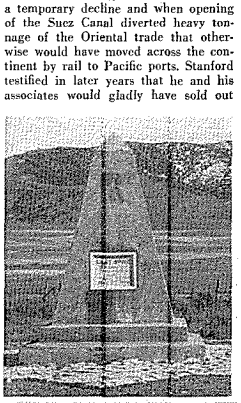
Construction of the line had progressed so rapidly that Central Pacific was not equipped with sleeping cars during the first weeks of operation. It was not until June 4, 1869, that the first of the company's Silver Palace Sleeping Cars arrived in Sacramento from the eastern manufacturer. The Union Pacific operated Pullman's Hotel Cars and Palace Sleeping Cars over its portion of the Pacific Railroad. All cars were wooden, lighted by candles and coal oil lamps, and heated by coal stoves at the ends of each car. (SP completed at its Sacramento Shops in 1906 one of the nation's first two steel passenger coaches built that year.) Primitive and crude as such equipment was by present-day standards, it represented a great advance in its day, and in fact contemporary travel guide books described the Silver Palace Sleeping Cars as "elegant," with "appointments of a home drawing room" and such comforts that one slept "amid the easy roll of the car as sweetly and refreshingly as ever upon the home bed." Central Pacific *operated its own sleeping* cars until July 1, 1883, when all such equipment was transferred to the Pullman Palace Car Company.

There were no dining cars on the pioneer trains. Most passengers, particularly those in coaches, got their meals at depot eating houses located for convenient train stops. Many followed the *guide book suggestions to bring well-*stocked baskets of food. Central Pacific provided buffets on most of its Silver Palace cars, as did Pullman on its Hotel Cars. The buffet was at one end of the car, and at first only canned edibles were available to supplement other moderate service. Usually there was a porter and cook on each car, but often the porter served in the two capacities. Tables were placed between seats of the sleeping car sections. The first separate dining cars in regular service were not operated by Pullman on the Overland Route until early in the '90s, and then only between Ogden and Truckee. The three cars used on this run were acquired by SP in 1894, from which date the railroad has operated its own dining car service.

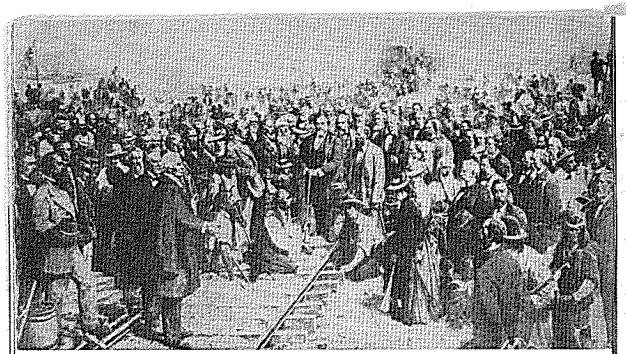
The original route of the Central Pacific north of Great Salt Lake became *a branch line in 1904* when SP opened a shorter main line over a trestle and fill built across the lake (the Lucin Cut-off, page 45). Today the pioneer route *around the lake is entirely abandoned.* The Last Spike was "unspiked" during a ceremony at Promontory on September 8, 1942, the track materials for 120 miles between Corinne and Lucin being salvaged for the war effort. Only a simple pyramid-type concrete monument remains in a nearly deserted region to mark the historic spot.

CHAPTER 2
Framework Takes Shape

JUST WHAT THE Big Four associates envisioned in May of 1869 as their ultimate railroad system is not known. They had taken certain steps toward expansion west and north from Sacra*mento, and had become interested in* other California railroad ventures, but the future apparently looked none too bright to them. What had loomed as lucrative traffic at the outset of their project began to fade away when Nevada mining activity, particularly the Comstock Lode operations, went into a temporary decline and when opening of the Suez Canal diverted heavy tonnage of the Oriental trade that otherwise would have moved across the continent by rail to Pacific ports. Stanford testified in later years that he and his associates would gladly have sold out



WHERE RAILS WERE JOINED to complete first transcontinental railroad is marked by monument (right) which stands isolated in Promontory hills. Pioneer line was abandoned in favor of a more direct route across Great Salt Lake to the south. Below: Canvas and board shacks, stores and other establishments like these at Promontory sprang up at camp sites as rails pushed ahead across Nevada and Utah plains. Like others, Promontory flourished for a short time and faded into oblivion as construction forces departed.



DRIVING THE LAST SPIKE. Amid pomp and ceremony befitting the occasion, Leland Stanford, president of the CP and recent governor of California, prepares to drive the final spike that completed the coast-to-coast twin threads of iron rail. Picture is copy of the famous Thomas Hill painting, which includes many dignitaries not present at the historic event. The painting now hangs in the State Capitol at Sacramento, California.

in 1869 for ten cents on the dollar, but the Central Pacific in operation was no more attractive to "smart" investors than it had been before the first rail was laid.

Expansion Begun

Although the Big Four continued building, it is doubtful they dreamed that in another eighteen years their 690-mile pioneer unit would expand to some 5,500 miles of lines radiating from San Francisco and Los Angeles to Portland, Ogden and New Orleans, with their own steamship lines plying between New Orleans, Havana and New York. This made Southern Pacific truly "transcontinental" with what was then the most extensive transportation system in the world. Much less could they have foreseen that the Promontory Last Spike was to be only one of many "last spikes" commemorating in succeeding decades the building of new lines into other regions as the Central Pacific founders and their successors opened vast western and southwestern areas to amazing development.

This expansion, in its initial stages, saw enfolded into Central Pacific's organization several independently established companies in central California, some of which were already in operation, while others existed only on paper. Their corporate identity, historic background, and properties owned would involve too much explanation to be recorded here. It was through their acquisition, and by new construction, however, that the Big Four gained entrance to the San Francisco Bay area; established the main north-south routes through California into Oregon and the Southwest; and organized the Southern Pacific Railroad Company and the Oregon and California Railroad Company, to join with the Central Pacific in carrying out the vast construction program of the '70s and '80s. From these pioneer companies emerged the present Southern Pacific Company.

While construction was under way on the transcontinental route over the Sierra and across Nevada to Promontory, Utah, the Big Four began extension of the line between Sacramento and the San Francisco Bay. This line through Stockton and Niles Canyon was over a route originally projected by the Western Pacific Railroad (no connection with the later company of the same name) whose federal authority for construction had been taken over by the Central Pacific. Transcontinental trains reached San Francisco Bay over the pioneer Oakland and Alameda "local" lines whose rail-ferry service to San Francisco had been in operation since 1863-64.

East Bay "Locals"

The Oakland "local" line was the San Francisco and Oakland Railroad Company, incorporated October 21, 1861, which began operation of its combination rail-ferry service on September 2, 1863, from Broadway in Oakland along Seventh Street to Oakland Wharf at Gibbon's Point and thence by ferry boat to the Davis Street landing between Broadway and Pacific wharfs in San Francisco. To meet competition of a rival ferry line on the Oakland Estuary "creek route," the railroad built a bridge (later filled in) across San Antonio Creek and extended its service to the town of San Antonio (now East Oakland) on September 28, 1864.

The Alameda "local" line was the San Francisco and Alameda Railroad Company, commonly called the "Encinal Road," incorporated March 25, 1863, which on August 25, 1864, began operation of its rail-ferry service from the Davis Street ferry landing in San Francisco to Alameda Wharf at the foot of Pacific Street (since abandoned), thence along what is now Lincoln Avenue to High Street, in Alameda. Extensions were opened to San Leandro on March 2, 1865, and to Hayward on the following August 24.

First ferry steamer on the Oakland service was the "Contra Costa," and the "Sophie McLane" inaugurated the Alameda service.

Overland passenger service was first operated to Alameda Wharf on September 6, 1869, and then transferred to Oakland Wharf the following November 8. Ferry boats carried passengers across the bay to San Francisco. The two-mile Oakland Long Wharf, opened for traffic January 16, 1871, remained the terminal for passenger trains until the present-day Oakland Pier (earlier known as the "Mole") was opened January 22, 1882. The route through Niles Canyon remained the main line for transcontinental and San Joaquin Valley trains until a line with less grade along the upper San Francisco Bay shore through Berkeley, Richmond, Port Costa and Martinez was completed to Tracy on September 8, 1878. Early the following year a line was opened from Benicia to connect at Suisun with the pioneer California Pacific's railroad from South Vallejo to Sacramento (to be described later) and on December 28, 1879, the car-transfer steamer "Solano," largest ferry boat in the world, began the transfer of trains across Carquinez Straits between Port Costa and Benicia to provide a shorter main line between Sacramento and the San Francisco Bay cities.

The central California area, already the starting point of the pioneer line over the Sierra later to be known as Southern Pacific's Overland Route through the mountains, also became the hub from which were projected the lines that now form the railroad's Shasta Route into the Northwest and the Sunset Route through the Southwest to New Orleans. The Big Four had the added distinction of giving the nation its second transcontinental rail route when Santa Fe joined the Southern Pacific at Deming, N. M., on March 1, 1881; the third route through connection with the Texas & Pacific at Sierra Blanca, Tex., on January 1, 1882; and the fourth when the Sunset Route was opened to traffic on February 5, 1883.

Construction on the western end of the Sunset Route was started December 31, 1869, branching from the transcontinental line at the newly established town of Lathrop. Only the most optimistic hopes could have prompted the Big Four to build into the San Joaquin Valley. The great broad region now so productive and populous was then nearly unoccupied. When looking over the proposed route, Stanford and Hopkins and their engineers traveled the upper section of the valley on horseback and camped out. For miles and miles they rode without seeing any sign of habitation, except an occasional sheep herder's shack. Many of the valley's large cities of today—Fresno, Merced, Modesto, Tulare and others—were just "railroad towns" in the '70s, founded by the railroad's builders. Traffic was inaugurated to Modesto on November 8, 1870; to Merced, January 15, 1872; to Fresno, May 28, 1872; to Tulare, July 25, 1872; and to Sumner (now East Bakersfield) on November 8, 1874.

For more than two hundred miles the builders had easy construction through the valley, but south of Bakersfield the Tehachapi mountains towered ahead of them. Here the engineers faced the problem of raising the railroad 2,734 feet from the valley at Caliente to scale the mountain pass at an elevation of 4,025 feet in about 16 air-line miles. This feat was accomplished by swerving 28 miles of track back and forth up the mountainside around gradual curves on a 2.2 per cent grade through 18 tunnels. At one point the track was looped over itself in a remarkable stroke of engineering skill directed by William Hood, who had by then become chief assistant engineer. The road was opened through Tehachapi out onto the desert to Mojave on August 8, 1876.

By-pass Los Angeles?

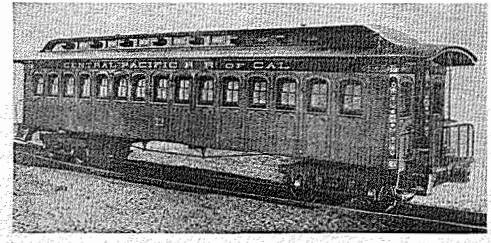
Before this date the Big Four and their engineers had pondered over the exact route for the railroad through southern California. At one time it was considered advisable to leave Los Angeles several miles to the west of the main line. The great metropolis of today was then a sleepy, little Mexican city with a population of less than 10,000. Trade of the area was being well served by steamers and sailing vessels; and, what was more important at the moment, the most direct and cheapest route for the transcontinental line would have been through the Cajon and San Gorgonio passes to the Colorado River, with a branch line later into Los Angeles.

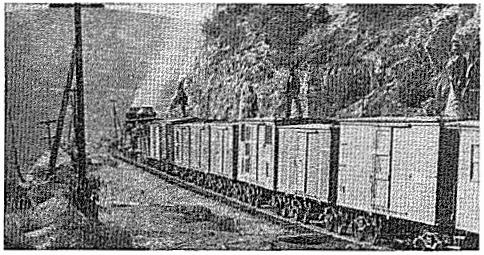
Vanguard of the famed Los Angeles boosters, however, had arrived even at that early date. The citizenry was not entirely asleep. Numerous conferences were held with the railroad's top men, and a proposition was submitted to the county's voters that won favor in an election on November 5, 1872. As a result, Southern Pacific acquired a 22-mile railroad from Los Angeles to Wilmington, opened in October, 1869, and construction was begun during 1873 on lines north and east out of the city. Trains were operated to Colton on July 16, 1875, and to Indio (then Indian Wells) on May 29, 1876. San Fernando had train service on January 21, 1874, and the line was extended northward through a 6,975-foot tunnel, then the second longest railroad bore in the country. It took nearly sixteen months to complete the tunnel, and by that time the gangs building south from Mojave had reached Soledad Canyon. Special trains brought official leaders from Los Angeles and San Francisco to a ceremony held at the little station of Lang on September 5, 1876, where Charles Crocker, then president of the Southern Pacific Railroad Company, drove the "last spike." Through service was inaugurated the next day.

Into Arizona

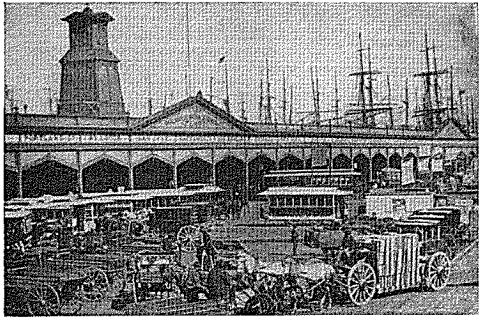
Moving on eastward from Indio, the railroad reached the west bank of the Colorado River opposite Yuma on May 23, 1877. There was delay in getting military authority to lay tracks across the Yuma Indian reservation, and it was September 30 that year before the bridge was completed so trains could operate into Yuma, a village known as Arizona City prior to 1873. Here rails of the SP were to have joined those of the Texas & Pacific, one of several railroads then holding, or seeking, federal authority to build lines from various sections of the country to the Pacific Coast. But since rail-head of the T & P

ORNATE IN BRIGHT PAINT, carved wood decorations and gold leaf trimmings were the first wooden coaches to come through from eastern factories when the transcontinental line was opened. Seats were straight backed and thinly cushioned, if at all. A coal stove furnished the only heat, candles and oil lamps provided the light. Open platform vestibules offered little protection from the weather when walking from one car to another.





EARLY-DAY FREIGHT TRAINS, with tiny box cars and diminutive woodburning locomotives, as shown in this one at Cape Horn in the Sierra, offer marked contrast with Southern Pacific's freight trains of today, pulled by diesel locomotives of 4,000 horsepower, or even more powerful. Best Central Pacific engine in 1865 could handle only 18 cars over the Sierra.



SAN FRANCISCO'S FERRY BUILDING as it looked in 1886. First units of this structure were built by Central Pacific in connection with slips built by the California State Harbor Commission. Ferry boats from Oakland Long Wharf made first use of this "commodious and convenient" passenger station on Sept. 4, 1875. This building continued as San Francisco's passenger terminal until the present Ferry Building was erected during 1896.

was at a standstill far off in Texas, SP continued building eastward.

Yuma was the railroad terminus for more than a year. Connection was made there with the Southwest's historic stage coach and freighting lines, first of which were the Southern Overland Mail opened in July 1857, over a route from San Antonio to San Diego, and the Butterfield Stages on a route from San Francisco to Tipton, Mo., with rail connections to St. Louis. John Butterfield made the initial 2,759-mile trip in 24 days, 20 hours, 30 minutes, leaving San Francisco September 16, 1858.

SP's tracks were pushed on from Yuma in November, 1878. At that time Tucson was the only town of any size all the way to El Paso, about 560 miles. Only stage coach and freight stations dotted the route, except at a short distance northerly there were the villages of Florence and Tempe, also the store, blacksmith shop, and a few buildings at a crossroads, the site of present-day Phoenix.

Arrival of the first train in Tucson on March 20, 1880, was celebrated with great enthusiasm, and the banners of all nations fluttered from the outer walls of the ancient pueblo. As the train approached the little city of 2,000 inhabitants a salute of 38 guns was fired and a cavalry band burst into a medley of patriotic tunes. Charles Crocker added another "last spike" to his collection.

As the railroad continued on from Tucson a military escort accompanied the construction forces over a portion of the route, for the Apaches were then on the warpath. The line was opened to Benson on June 22, 1880; through what is now Willcox, to Lordsburg on October 18; to Deming, December 15; and to El Paso on May 19, 1881.

Here another track-laying race developed. The Texas & Pacific line had reached Dallas and was pushing westward rapidly to check the drive of the SP into Texas. In the mountainous country southeast of El Paso there was but one logical route for a railroad into the valley of the Rio Grande. The first company to lay its rails through the pass would have undisputed right-of-way from Sierra Blanca to El Paso. This objective was won by the SP forces, and the road opened into Sierra Blanca on November 25, 1881.

Texas and Louisiana Lines

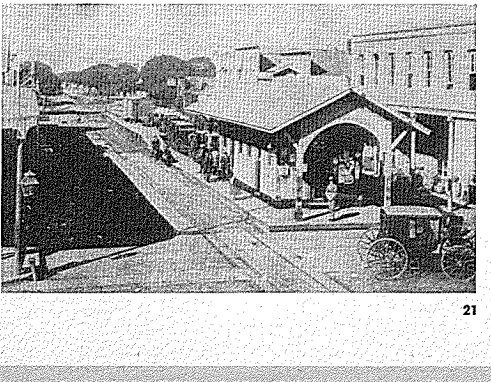
Present-day Texas and Louisiana Lines of the SP, with headquarters at Houston, Texas, comprise 4,292 miles of lines originally operated as several different companies. Two of these, the Buffalo Bayou, Brazos & Colorado Railway and the New Orleans, Opelousas & Great Western Railroad, had portions of their properties in operation prior to organization of the Central Pacific and Southern Pacific in California.

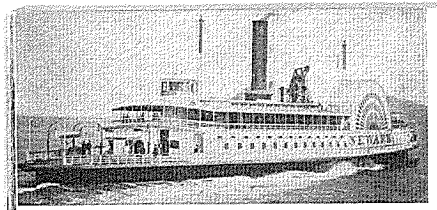
Survey work for the BBB&C from Harrisburg (Houston) to Alleyton, Texas, was started on May 17, 1851. Despite the uncertainty of the times, the railroad had constructed 50 miles of track by 1858, and was laying track at the rate of three miles per week.

Eight years of struggle in surmounting great difficulties were required to build the first 80 miles of line from Harrisburg to the banks of the Colorado River. Eight long years to build a tiny railroad—insignificant in the vastness of America—and yet unforgettable as long as a wheel turns anywhere along the vast system of which it was to become the oldest part.

The BBB&C was one of the first (if not the first American railroad) to adopt the measure of four feet eight and one-half inches as the distance between the rails, the gauge now known as "standard." This gauge was subsequently adopted by every other railroad; but as late as 1871, no less than 23 different gauges ranging from three to six feet were in use on American railroads.

OAKLAND'S FIRST RAILROAD STATION at 7th and Broadway. Here crowds gathered Nov. 8, 1869, to greet the first overland trains to reach this city from Chicago and the East. It was over the western extension of the first transcontinental line, now part of SP's system, that Oakland was given its first rail connection with the rest of the nation.





FERRY STEAMER "NEWARK," as it appeared in 1879, was first ferry built for the old South Pacific Coast narrow gauge railroad. It began service in June, 1878, between San Francisco and Alameda. It was dismantled in 1921 to become part of the ferry "Sacramento."

The first locomotive purchased by the BBB&C was the "General Sherman," delivered second hand via ship at Galveston in November 1852. The "General Sherman" had a huge funnel-shaped smoke stack later adopted by most of the cotton-carrying railroads, the theory being that this equipment helped to curtail cotton fires.

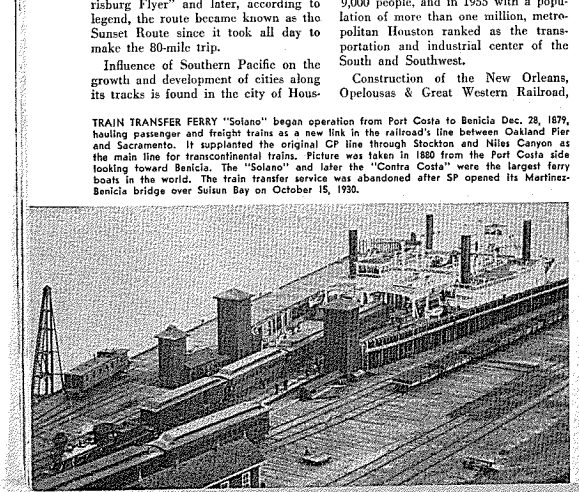
The westbound train from Harrisburg to Alleyton was first known as the "Harrisburg Flyer" and later, according to legend, the route became known as the Sunset Route since it took all day to make the 80-mile trip.

Influence of Southern Pacific on the growth and development of cities along its tracks is found in the city of Houston. With the withdrawal of the capital of the Republic of Texas from Houston to Austin in 1839, Houston stood in danger of becoming a ghost town. When construction of the BBB&C started it was smaller than Harrisburg, the eastern terminus of the railroad.

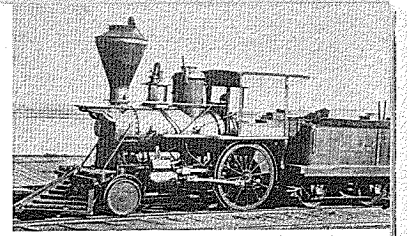
With the coming of rail transportation, however, Houston began to grow and prosper. By 1858 it had a population of 4,815, by 1872 it had close to 9,000 people, and in 1955 with a population of more than one million, metropolitan Houston ranked as the transportation and industrial center of the South and Southwest.

Construction of the New Orleans, Opelousas & Great Western Railroad, now SP's mainline between New Orleans and Morgan City, La., and second oldest segment of the present SP system, was started in October, 1852.

TRAIN TRANSFER FERRY "Solano" began operation from Port Costa to Benicia Dec. 28, 1879, hauling passenger and freight trains as a new link in the railroad's line between Oakland Pier and Sacramento. It supplanted the original CP line through Stockton and Niles Canyon as the main line for transcontinental trains. Picture was taken in 1880 from the Port Costa side looking toward Benicia. The "Solano" and later the "Contra Costa" were the largest ferry boats in the world. The train transfer service was abandoned after SP opened its Martinez-Benicia bridge over Suisun Bay on October 15, 1930.



LOCOMOTIVE "SAN GABRIEL," first to turn a wheel in southern California, was placed in service January 14, 1869, by the Los Angeles & San Pedro Railroad Company on the line then being built from Wilmington to Los Angeles. It was scrapped in 1876, after this 22-mile line was taken over by SP.



Like the pioneers who built the BBB&C, the original backers of the NOO&GW were men of vision and courage. Undeterred by the failures of numerous railroad projects in those years, they embarked on the building of a rail line across some of the most difficult terrain in the United States. At the time the NOO&GW was organized, only three railroads, averaging five miles each, served New Orleans.

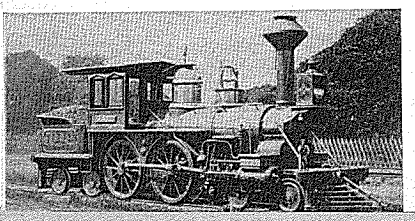
The NOO&GW properties were acquired by Charles Morgan on May 25, 1869, and the name later was changed to Morgan's Louisiana & Texas Railroad and Steamship Co. Morgan, who operated steamships out of Mobile in the 1860's, early saw the need of coordinated rail-steamship service. He transferred his operations to New Orleans following acquisition of the NOO&GW and for several years operated a fleet of steamers between Brashear City (Morgan City) and Galveston.

The Morgan fleet in 1873 included 16 sidewheelers and was one of the most important factors in the commerce of the Gulf of Mexico.

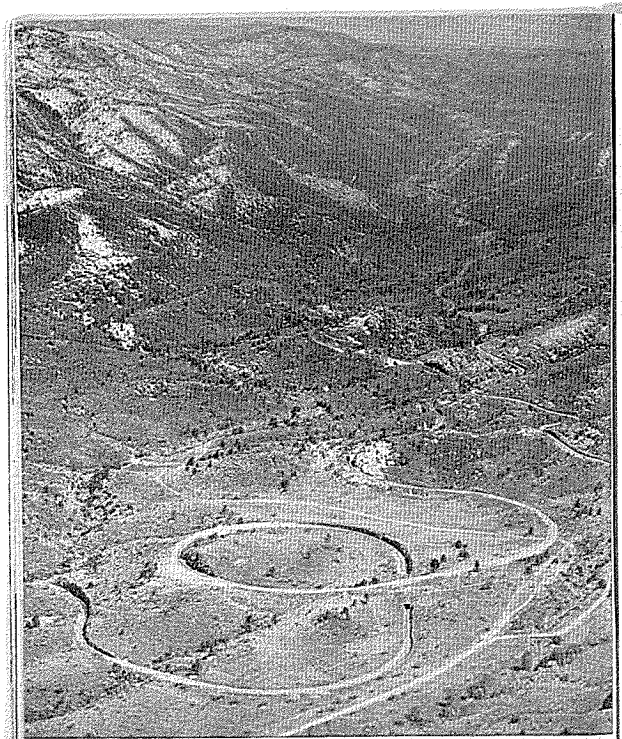
Rail construction west of Berwick Bay at Morgan City was started during the summer of 1878 under the supervision of Julius Kruttschnitt, who later became chairman of the board for Southern Pacific. The line reached Franklin, La., in May, 1879, and the first work trains entered Vermilionville in March, 1880. That same year, construction was pushed northward from Vermilionville (which became Lafayette in 1884) reaching Washington in May, 1881, and Chenevville, La., in May, 1882.

Meanwhile the Texas & New Orleans Railroad had completed a line from Houston to Orange, Texas. The New Orleans, Mobile and Texas Railroad also had projected a line from Lafayette to the Sabine River to connect with this railroad.

On March 30, 1878, the newly organized Louisiana Western Railroad purchased the old grade of the NOM&T



LOCOMOTIVE "LIBERTY" was first one operated by the San Francisco & Oakland Railroad Company, whose rail-ferry service between SF-Oakland began September 2, 1863. One of the first locomotives constructed on the Pacific Coast.



FAMED LOOP in the Tehachapi Mountains south of Bakersfield was a master stroke of engineering. Problem was to gain quick elevation of 2234 feet in only 16 air-line miles. Viewed from air the loop and its immediate approaches resemble two giant circles with the track tunneled thru a ridge, twisted around the crest of a peak and then back over the top of the tunnel. This Dorman Photo looks south, with former highway on the right.

and with minor changes followed the route to the Sabine River. Joining of the Louisiana Western and Texas & New Orleans Railroad provided through service between New Orleans and Houston. Extension of the BBB&C properties west to San Antonio on February 5, 1877, by its successor, the Galveston, Harrisburg & San Antonio Railroad, paved the way for completion of the Sunset Route near confluence with the Pecos and Rio Grande rivers.

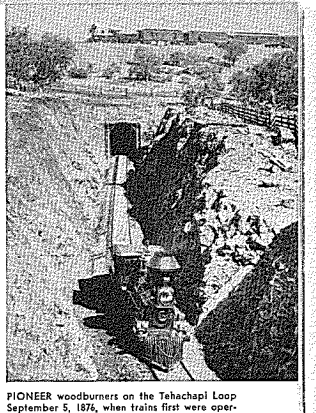
During this period Collis P. Huntington became interested in linking these rail lines in Texas and Louisiana with the Southern Pacific which then was heading eastward from Los Angeles. It was about 1879 that he purchased for his West Coast associates an interest in the GH&SA. The two railroads joined tracks on January 12, 1883, the GH&SA meeting the Southern Pacific at a point near site of the first Pecos High Bridge.

Col. T. W. Peirce, president of the GH&SA, drove the last spike on a section of the original line that was abandoned in 1892 when the first Pecos High Bridge was completed and a new and shorter line placed in service between Del Rio and Sanderson.

First through passenger trains over the newly completed Sunset Route between San Francisco and New Orleans left those respective cities on February 5, 1883. For many years (until 1941) the voyage of "a hundred golden hours at sea" between New Orleans and New York on SP's Morgan Line ships was an alluring attraction on the transcontinental Sunset Route.

Mexican International

The Mexican International Railroad Company was formed in 1882 to build a line from Piedras Negras, just across the Rio Grande from Eagle Pass, Texas, to Mazatlan on the Pacific Coast. Construction began the following year, and five years later rails were in Torreon. During this time, Southern Pacific acquired most of the outstanding stock,



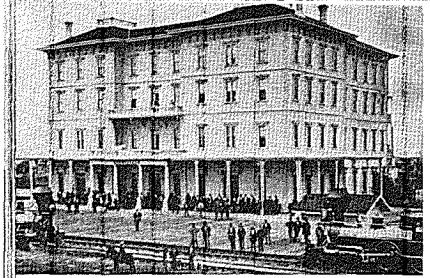
PIONEER woodburners on the Tehachapi Loop September 5, 1876, when trains first were operated over the new rail route that linked Los Angeles and San Francisco.

and C. P. Huntington became president. In 1892, the line reached Durango, 540 miles from Piedras Negras. From that time on, construction was limited to a connection to Monterrey and to various branches, bringing total mileage to some 900 miles when the stock was sold to the National Railways of Mexico in 1910.

Start of Shasta Route

This sketch now turns back to the '60s, again to central California where, at Marysville in the Sacramento Valley, SP's Shasta Route was born.

The bustling little pioneer city rivaled Sacramento as a center of railroad enthusiasm in the '50s and '60s. Companies were organized and some construction done in that section of the state, but it was not until the Big Four got behind one of the projects that Marysville greeted its first train from Sacramento, via Junction (now Roseville) and Lin-



NEW CITIES: Many of the West's present-day cities were founded by the Southern Pacific-Central Pacific builders. Among them are Reno, Nevada; and Fresno, Merced and Modesto in California. Others were already founded but it wasn't until the coming of the railroad that they began to flourish and grow. Picture shows two woodburner locomotives in front of the El Capitan Hotel, one of the first buildings erected in Merced.

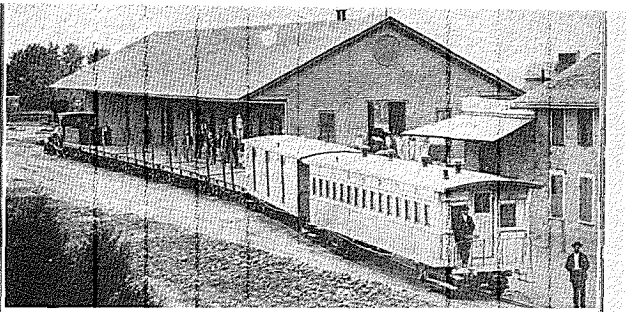
coln on June 1, 1869. Marysville promoters had earlier launched an ambitious plan for a railroad via Knights Landing, Davisville (now Davis) and Suisun to Vallejo, and thence to San Francisco by boat. During 1859-60 the road was graded about 60 miles to Suisun. Money could not be raised for rail and equipment so the project was halted until advent of the California Pacific Railroad, strongly financed by English capital, as a competitor to the Big Four's Central Pacific, gave Marysville its second rail line in March, 1870, linked with the "Cal-P" rail-steamer system to Sacramento, Vallejo and San Francisco. Central Pacific acquired control of this system about August, 1871.

The Marysville project that launched today's Shasta Route was the California & Oregon Railroad Co., temporarily organized in 1863 and incorporated June 30, 1865, to build to Portland. Preliminary surveys were run, congressional support obtained, and Oregon personages brought into the enterprise, which was headed by Simon J. Elliott.

The Oregon faction split into two rival groups. Each took the identical name of Oregon Central Railroad Company and each broke ground at Portland in April, 1868. But the group headed by Joseph Gaston, and backed principally by Portland men, started its line on the west side of the Willamette River, while the group sponsored mostly by Salem interests favored the east side of the river. The auspicious beginnings were but mere gestures, for neither group could go far without the federal aid authorized by Congress in July, 1866. A bitter legal and political tussle was under way when Ben Holladay, colorful westerner fresh from lucrative exploits with Pony Express, stage coach and steamship ventures, cast his lot with the "East Side" company.

First Twenty Miles

Under his leadership the "east siders" won federal favor, but the summer of 1869 found his company far short of the goal of 20 miles that must be in operation before Christmas Day to comply with all provisions of the Congressional Act. The situation called for fast action and Holladay delivered in a grand manner. The first rail was laid October 26, 1869, and the first locomotive, "J. B. Stephens," rolled onto the rails November 11. Biggest job was a 380-foot bridge across the Clackamas River. The structure was well along when high flood waters damaged it badly. While reconstruction was rushed, a small locomotive was floated across the river so that rail laying could proceed on the other



FIRST RAILROAD STATION in Los Angeles was built by the Los Angeles & San Pedro railroad and opened October 26, 1869, when the first train operated in southern California was a free excursion from the new station to and of the line at Wilmington. Regular service was inaugurated November 1, 1869. The property was consolidated with Southern Pacific in December 1874, and was linked to the first transcontinental railroad when Southern Pacific completed its line southward through the San Joaquin Valley on Sept. 5, 1876.

side. On December 24 the last spike was driven in the first 20 miles of the road, and next day the "J. B. Stephens" crossed the Clackamas bridge to give the "East Side" company a definite victory. There was no construction on the "West Side" line until it, too, came under Holladay's wing.

Before continuing with his line on the east side of the river during 1870, Holladay had frustrated an attempt of a rival company to build from Astoria across the state to connect in Nevada with the Central Pacific Overland Route; had obtained substantial backing from capitalists in Germany; had bought out the "West Side" company; and on March 16, 1870, had reorganized his entire enterprise as the Oregon & California Railroad Company. The railroad was a great attraction at Oregon's annual state fair at Salem to which point the O & C began operation on September 29, 1870. "The toot of the locomotive whistle any hour of the day," stated one newspaper, "never fails to start crowds of sightseers toward the tracks, and the arrival or departure of a train calls out hundreds of people who never saw that style of wagon before."

Stage Trip Cut

Trains were in operation to Salem depot on October 11 and to Albany on December 25, 1870; to Harrisburg, June 25, and to Eugene on October 15, 1871, when the 345-mile stage coach trip to the Redding, Cal., terminus of the railroad, was cut to five days. The railroad reached Roseburg December 3, 1872. There construction was halted nine years. Holladay failed financially. Money acquired by sale of bonds in advance of construction had been spent with reckless abandon. Traffic revenue from the sparsely settled region was not sufficient to meet expenses, and when bond interest could not be met in 1873, Holladay was forced out and the property taken over by the German investors.

Prior to this the "West Side" line was operated from Portland to Hillsboro on

December 23, 1871, but it was January 28, 1880, before trains were run through from McMinnville to Corvallis.

Villard Takes Over

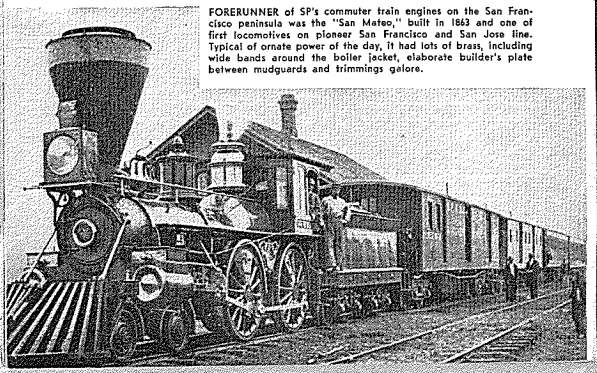
The German bondholders sent Henry Villard to Oregon to look after their railroad interests. In succeeding years he became a national figure in transportation affairs. The entire Northwest was his field of operation, with the pioneer O & C line but one of his enterprises that included not only railroads but also steamship operations along the Pacific Coast and on the Columbia River. He was president of the Northern Pacific when that company completed its transcontinental line into Portland during August, 1883, and was the organizer and leading figure in the Oregon Railway & Navigation Company, later a unit of the Union Pacific line into Portland.

In 1876 he approached the Big Four with a proposition to buy the O & C and complete the railroad between the two states, but Huntington and his associates were not then interested. It was not until June, 1881, that construction was resumed on the O & C south of Roseburg. Trains were operated to Glendale May 13, 1883; to Grants Pass, December 2; through Medford to Phoenix, February 25, 1884; and to Ashland, May 4. At this point Villard's regime crashed. The O & C was forced into receivership and on July 1, 1887, the properties were formally acquired under lease by the Southern Pacific.

Construction of the California portion of the line to Oregon was begun north from Marysville in October, 1869. Trains were operated to Chico on July 2, 1870; to Tehama, August 28, 1871; Red Bluff, December 6, 1871, and to Redding on September 1, 1872, where the terminus remained 12 years while the builders in Oregon were in and out of the financial wringer.

Under the name of Northern Railway Company, Southern Pacific completed a line along the west side of Sacramento Valley between Davis and Tehama, September 27, 1882. (This west side track is now used by fast passenger trains of the Shasta Route as a shorter route to and from San Francisco than the route through Marysville.)

Work was resumed from Redding in April, 1883, and heavy construction into the Siskiyou Mountains was undertaken.



FORERUNNER of SP's commuter train engines on the San Francisco peninsula was the "San Mateo," built in 1863 and one of first locomotives on pioneer San Francisco and San Jose line. Typical of ornate power of the day, it had lots of brass, including wide bands around the boiler jacket, elaborate builder's plate between mudguards and trimmings galore.

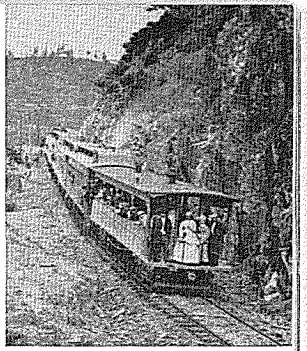
Trains were operated to Dunsmuir, August 23, 1886, and to Hornbrook near the state line on May 1, 1887. During that year Southern Pacific pushed construction simultaneously from Hornbrook north and from Ashland south. Summit of the Siskiyous was crossed at an elevation of 4135 feet. A 3108-foot tunnel at the summit was the longest of 18 bores. Track was laid over curvatures reaching up to 14 degrees on a maximum grade of 3.3 per cent. There were 100 miles of curved track in a distance of 171 miles, and north of Redding the Sacramento River was crossed 17 times.

The "last spike" ceremony on December 17, 1887, was staged in the south end of the railroad yard at Ashland. Charles Crocker again had the distinction of adding the finishing touch to another vital rail link amid the cheering of a large delegation brought by special trains from Portland and San Francisco. The rugged stage coach journey that had taken seven days between Portland and Sacramento in 1869 was now cut to 38 hours by train.

Also during 1887 an extension was built from Saugus on the San Joaquin Valley line and opened for traffic to Santa Paula on February 8, to Ventura May 18, and to Carpinteria July 1. On August 19 practically the entire population of the little city of Santa Barbara gathered at the new station to greet special trains that brought distinguished visitors from San Francisco, Los Angeles and other cities to join in celebrating the arrival of the Iron Horse.

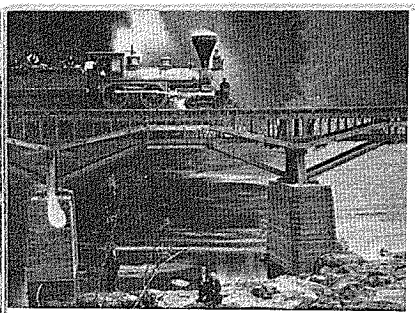
South Pacific Coast R. R.

An important Southern Pacific acquisition on July 1, 1887, was the South Pacific Coast property in California, which included more than 100 miles of main and branch line narrow gauge railroad from Oakland and Alameda to Santa Cruz, ferry boat service on San Francisco Bay, and three miles of horse-drawn street car, freight and passenger service between Newark and Centerville. Built by Alfred E. Davis for James G. Fair and the latter's mining associates of Comstock Lode fame, the company was incorporated March 25, 1876. The immediate objective was Santa Cruz, but it was the intention to extend the line down Salinas Valley and across the Coast Range mountains to an ultimate connection with the Denver & Rio Grande, which at that time was a narrow gauge line building westward.



OPEN AIR OBSERVATION CAR of pioneer Atlantic and Pacific Express pauses at Cape Horn about 1870 to give Central Pacific passengers a view of American River canyon below. First express made trip from Chicago to San Francisco in about five and a half days.

Starting point of the South Pacific Coast line was at Dumbarton Point on San Francisco Bay near Newark. Construction was commenced there in May, 1876, and the line opened into San Jose the latter part of the following year. Building continued through Los Gatos (service began June 1, 1878) to a connection near Big Trees with the eight-mile Santa Cruz and Felton line, which had been independently built and in operation to "Old" Felton since October, 1875, and which was acquired by the Davis-Fair interests. In the meantime



"J. B. STEPHENS," locomotive of the Oregon & California Railroad, on the bridge across the Clackamas River south of Portland, early in 1870. Construction of this 380-foot bridge was the biggest single job in completing the first 20 miles of railroad south from Portland, to place the line in operation on Christmas Day of 1869 to meet federal requirements guaranteeing financial aid to the railroad.

construction had been under way south from San Francisco Bay, starting from a wharf at Alameda Point. This 25-mile section to Newark, together with ferry service across the bay to San Francisco, was placed in service June 1, 1878, and through trains to Santa Cruz were in operation May 15, 1880. Service to Webster Street in Oakland was begun May 30, 1881, over a bridge across San Antonio Creek (the Estuary), the line later being extended to 14th and Franklin Streets and opened to traffic October 1, 1886. Bay terminal of the narrow gauge was moved March 14, 1884, to a new pier on the south bank of the Creek, which trestle was later filled in to become Alameda Mole. (During 1906-07 the line was changed to standard gauge. Heavy storms of 1939-40 did such extensive damage to tracks and tunnels in Los Gatos canyon that SP was granted authority on September 20, 1940, to abandon the poorly patronized 15-mile portion from Los Gatos to a point about nine miles from Santa Cruz.)

Coast Line Extended

The Coast Line as it exists today was not opened through to Los Angeles until after the turn of the century. This route had its origin in the San Francisco & San Jose Railroad, which was opened between those two cities on January 16, 1864. Some of the founders of this company then organized the Southern Pacific Railroad Company, which was incorporated on December 2, 1865, and in the following year authorized by Congress to build south through the Santa Clara, San Benito and San Joaquin valleys to the California state line near Needles, where it would meet the Atlantic & Pacific (Santa Fe) then projecting its road westward. The original organizers did no construction, but sold their interests to the Big Four of the Central Pacific, which had in 1868 acquired the pioneer line between San Francisco and San Jose. During 1870 the Big Four reorganized the Southern Pacific Railroad Company, and under its name carried through much of the construction already referred to in this sketch.

Early in 1868 construction was begun on the line south of San Jose and on March 13, 1869, trains were operating to Gilroy. It was the intention to follow the proposed route through Pacheco Pass into the San Joaquin Valley, but the cost of construction and operation over the mountainous section of the Coast Range, also the uncertainty of local traffic developing on the far western slope of the valley, halted further work over that route after the road had been opened to Hollister on July 13, 1871, and to the terminus at Tres Pinos on August 12, 1873. The main line south from Gilroy was opened to Pajaro (Watsonville Jct.) on November 27, 1871; to Salinas on November 1, 1872; and to Soledad on August 12, 1873. There the terminus remained for thirteen years while construction forces concentrated on completing the line through the San Joaquin Valley and eastward from Los Angeles, as already described.

It was 1886 before work could be resumed again south from Soledad. Trains were operating to King City on July 20 that year, to Paso Robles on October 31, and to Templeton on November 16. As the year 1887 ended, heavy construction was under way in the Santa Lucia Mountains north of San Luis Obispo.

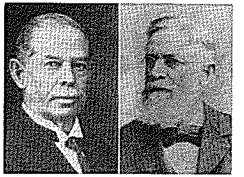
Framework Completed

With the Shasta Route added to its Overland and Sunset Routes, and with a portion of its Coast Line completed, the framework of Southern Pacific's ultimate system had begun to take shape. It was, of course, but a skeleton framework; for, in reaching its present-day status, the 5,500 miles of railroad operated at the end of 1887 was to be increased nearly threefold with vast expansions to develop and serve SP's far-flung territory through new construction and through the acquisition of other railroad properties. Southern Pacific and its far western territory were growing up together; its history intimately associated with the communities it served.

CHAPTER 3

Reorganization and Expansion

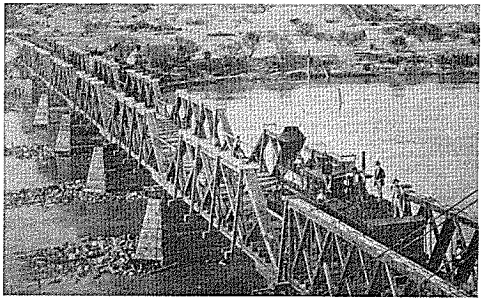
BEFORE PROCEEDING with the history covering the construction of new lines and expansion of the Central Pacific-Southern Pacific system beyond the end of 1887, attention should be given the corporate reorganization effected during 1884-85 which brought numerous pioneer companies under the single banner of the Southern Pacific Company of today.



WM. HOOD AND J. H. STROBRIDGE were prominently identified with SP-CP throughout the West. Strobridge was construction superintendent on the line over the Sierra. He followed the railhead through San Joaquin Valley and the Southwest to completion of the Sunset Route, and also to completion of the Shasta Route over the Siskiyou Mountains. Hood joined Central Pacific in 1867 during construction in the Sierra, became chief engineer of Southern Pacific in 1885. Among outstanding engineering jobs under his direction were Tehachapi Loop and Great Salt Lake Cut-off.

Prior to this reorganization, all the rail and steamer lines originated or acquired by the Big Four associates had been operated under lease by the Central Pacific. However, gradual expansion of properties under the name of the Southern Pacific Railroad Company from the Pacific Coast through the Southwest, with affiliated lines to New Orleans and by steamship lines to the Atlantic Coast, had made that company the stronger organization from a traffic producing standpoint. This factor no doubt influenced selection of the name for the new company.

Southern Pacific Company was created March 17, 1884, by special Act of the Legislature of Kentucky, and its formal organization was effected on August 14 following meetings in New York City. Long-term leases to Southern Pacific Company were thereafter executed covering properties of the Southern Pacific Railroad Company,



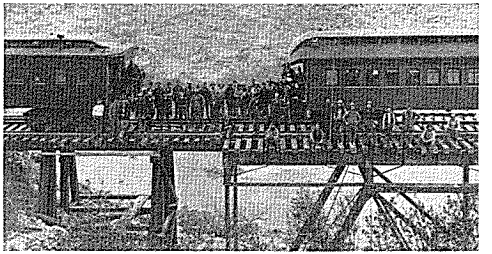
SOUTHERN PACIFIC'S FIRST BRIDGE across the Colorado River at Yuma looked like this in 1877. Rail laying had reached the California side of the river in May of that year. It was the following September 30 when first trains were operated into Yuma.

Central Pacific Railroad Company, and all other companies of common control.

As a personal venture, Huntington had acquired control of the Chesapeake & Ohio railroad during 1869, and at the reorganization meetings he tried unsuccessfully to interest his associates in joining him; nor were they agreeable to the suggestion that the C & O be included with Southern Pacific in the creation of a railroad system under one management extending from the Pacific to the Atlantic seaboard.

Principal officers of the new company, elected with President Stanford at the first stockholders' meeting on April 8, 1885, included: Huntington and Crocker, 1st and 2nd vice president, respectively, each with offices in New York City; Timothy Hopkins (foster son of Mark Hopkins), treasurer; J. C. Stubbs, traffic manager; A. N. Towne, general manager of the 3,004 miles of Pacific System lines west of El Paso and Ogden; and A. C. Hutchinson, general manager of the 1,692 miles of Atlantic System lines east of El Paso. Five years later Huntington was elected president and took over complete operations of the company, while Stanford, who had been elected U. S. senator from California in 1885, assumed a nominal role in the railroad's affairs as chairman of the executive committee.

During these years much attention was given Central Pacific's probable ability to meet payment in 1895 of the first of the government bonds for money loaned to aid in constructing the western portion of the first transcontinental line east from Sacramento, California, to Promontory, Utah. The Thurman Act of 1878 specified a sinking fund plan for retirement of the government bonds, the merit of which was strongly debated; and in 1887 the Pacific Railroad Commission was named to investigate affairs of all the railroads which had received federal aid during their construction. Government spokesmen were frankly pessimistic about receiving payment and anticipated that the Central Pacific Railroad Company would be obliged to go into receivership. Final outcome was that an agreement for settlement of the



LAST SPIKE IN SUNSET ROUTE was driven January 12, 1883, in western Texas, about two miles from the original bridge that crossed the Pecos River near its confluence with the Rio Grande. Site of the ceremony was on a portion of line abandoned when a new line with new high bridge was opened for traffic in 1892. Picture shows some of group that participated in the ceremony, including Col. T. W. Peirce, president of the Galveston, Harrisburg & San Antonio Ry., one of the pioneer units that comprised SP's Sunset Route.

debt was adopted early in 1899, calling for organization of a new Central Pacific Railway Company to take the place of the Big Four's original company, and the issuance by the new company of $125,000,000 in bonds, all of which were guaranteed by Southern Pacific Company. Through this endorsement the finally computed Central Pacific debt to the government of about $58,813,000 was paid in full by Southern Pacific in July, 1908.

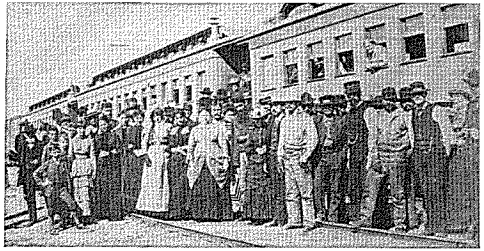
Southern Pacific Company stands today with a remarkable record among major railroads in never having gone through receivership.

Additions After 1887

During the twelve and a half years after 1887 a total of 2,630 miles of lines were added to Southern Pacific's operations, about 70 per cent of it being on the Pacific System. The principal western additions included considerable new construction and line acquisitions on both sides of the San Joaquin Valley in California; stock purchase of the 300-mile narrow gauge Carson & Colorado railroad in Nevada and eastern California; completion of the Coast Line in California from San Francisco to Santa Barbara; construction and acquisition of a number of short main and branch lines in southern California; and acquisition of the narrow gauge Oregonian Railway lines on the east and west sides of the Willamette Valley in Oregon.

The Atlantic System in Texas and Louisiana added 522 miles to its operations during the same twelve and a half year period. However, not included in this increase were the separately operated, but closely affiliated, 668 miles of the Houston & Texas Central, the pioneer "Central" road serving northern and central Texas; nor the 687 miles of the San Antonio & Aransas Pass Railway serving southern portions of Texas. Both these properties were later to be included in the Atlantic System lines.

Expanding into Mexico, Southern Pacific, through a reciprocal lease with the Santa Fe, had acquired the old Sonora Railway between Nogales and Guaymas and its Arizona connection to Benson,



EMIGRANTS FROM OVER WORLD poured into the West and Southwest after region was opened by first railroad. Extremely low fares were good for travel in emigrant cars that moved west in mixed trains. This picture shows group en route across Nevada in 1886.

in exchange for the 242-mile main line which Southern Pacific had completed in 1883 from Mojave to Needles. Under terms of a lease dated July 15, 1898, the Santa Fe obtained joint operating rights over SP's line across the Tehachapi Pass between Mojave and Bakersfield.

The turn of the century brought to Southern Pacific the next major phase in its development, and also brought new personalities into the management of the railroad's properties. Huntington was the last survivor of the quartet of Sacramento merchants whose courage and sagacity had created the western portions of the nation's first transcontinental rail routes, and who were to become immortal in the annals of western achievement.

Last of Big Four

Huntington was recognized as one of the world's outstanding industrial leaders when death came to him suddenly on August 13, 1900. Mark Hopkins, oldest of the group, died March 29, 1878; Charles Crocker on August 14, 1888; and Leland Stanford on June 21, 1893, while in his second term as United States Senator and eight years after founding Stanford University at Palo Alto, California.

At the time of Huntington's death, Southern Pacific was operating more than 8,000 miles of railroad extending from Portland, Ore., to Guaymas, Mex., and from Pacific Coast cities to Ogden and New Orleans. Its steamship lines operated from Gulf of Mexico ports to New York and Havana. Southern Pacific was then the longest and one of the major transportation systems in the country.

While Southern Pacific's properties were being expanded under the guidance of Huntington, the Union Pacific system, which joined SP at Ogden, had developed to a strong position under the direction of E. H. Harriman. Purchase of the old Central Pacific line westward from Ogden to San Francisco had been sought by Harriman, but Southern Pacific would not sell. The only recourse for Harriman was through acquiring control of the entire Southern Pacific system, and in Huntington's death he gained the opportunity.

Through a series of skillful financial negotiations, Harriman had by March,

SANTA BARBARA'S FIRST TRAIN on August 19, 1887, rolled in from Saugus through Fillmore, Santa Paula, Ventura, and attracted excited crowds. Next day a special excursion train brought distinguished visitors from over California to join the civic celebration. Line north of Santa Barbara was opened in March, 1901, and present line south in March, 1904.

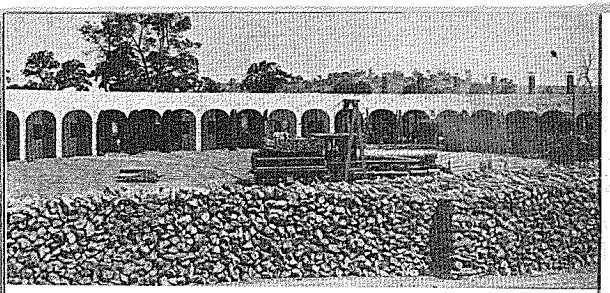
1901, caused the Union Pacific, through one of its subsidiaries, to acquire from the Huntington estate and others about 37½ per cent of Southern Pacific's outstanding stock, which was sufficient for control of the company. Later this interest was increased to 46 per cent of the stock. Harriman was elected chairman of the SP executive committee in April, 1901, and became president on September 26 the same year, a position in which Charles M. Hays had served for nine months.

Harriman appointed Julius Kruttschnitt as general manager of the entire Southern Pacific System. Kruttschnitt had entered Southern Pacific from the position of chief engineer and superintendent of Morgan's Louisiana & Texas Railroad and Steamship Company. He was an outstanding operations man, and he also held simultaneously the titles of fourth vice president and assistant to the president. In 1904 Harriman named him director of maintenance and operations for all steamship and railroad lines in the "Harriman System," except those in Texas.

Kruttschnitt's headquarters were in Chicago, Harriman's in New York.

Harriman knew that no one had been more aware than Huntington of the fact that the vast skeleton system created by the Big Four required extensive rehabilitation to bring it to a proper standard of transportation efficiency. Numerous projects conceived by Huntington were advanced beyond the preliminary blueprint stage by his engineers, under Chief Engineer William Hood. Property rights were obtained in many instances and some construction was started. However, SP was not in a financial position to launch the full-scale program until Harriman's reorganization made finances available.

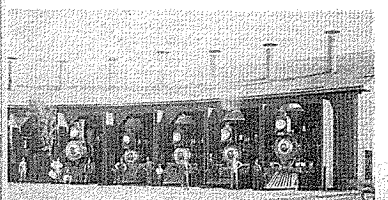
More than $240,000,000 was spent during the eight years of Harriman's



STALLS FOR IRON HORSES, illustrated on this page, reflect the development of railroading through the years. The hand operated turntable (above) at the Rocklin, Cal., roundhouse and the pile of wood for locomotive fuel are characteristic of period around 1868.

administration (he died September 9, 1909) on reconstruction and new equipment, for the building or purchase of new lines and for general improvements.

In general on SP's lines, curves were lessened, grades reduced, bridges improved or rebuilt, and an extensive rail replacement program instituted. Automatic block signals, use of which for two-way single track operation had been developed by Southern Pacific, were installed until they protected about 4000 miles of main line by 1909. Use of safety devices on locomotives and cars,



Left: a coal-burner with a straight stack makes its appearance among the diamond-stacked woodburners at the Lathrop roundhouse in 1891. Below, the battery of powerful cab-aheads in one section of Roseville's 32-stall roundhouse was photographed before wartime load eliminated further displays of idleness.

such as air brakes and automatic couplers, was increased and improved. Use of oil as fuel for locomotives became general, replacing coal, in the first decade of the new century. A new type locomotive was developed, later to be popularly called "cab-ahead," giving enginemen a better view ahead on mountainous curving track. Between 1901 and 1909 capacity of the average freight car was raised from 27 to 37 tons and the average train load from 305 to 472 tons. Only a few of the major construction projects can be reviewed here.

Going to Sea by Rail

One of the most difficult and spectacular pieces of construction was the now famous Lucin cut-off across Great Salt Lake, where for 32 miles the railroad "goes to sea" over a trestle and fill, nearly 12 miles of which is supported on piles. The entire cut-off project extended for 103 miles between Lucin and Ogden, and was in turn part of a program calling for extensive rehabilitation of 373 miles of the original Central Pacific line between Reno and Ogden, with the old line shortened and strengthened and completely replaced over many sections. One line change took Wadsworth off the main line and the division terminal was moved during the summer of 1904 to the new town of Sparks.

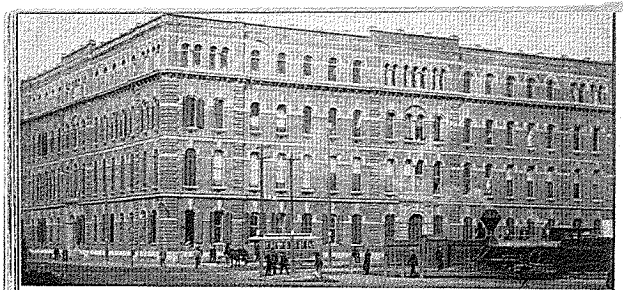
Construction on Lucin cut-off began March 17, 1902, and on November 13, 1903, tracks from the east and west shores met near the center of the lake. Although maximum depth of the lake was only 32 feet, the undertaking proved a tremendous one. The bottom of the lake was treacherous and unstable, and there were times when it seemed the fills and trestles would be swallowed in the mud. Completion of the job was formally celebrated on Thanksgiving Day, November 26, 1903, but the line was not opened to traffic until March 8, 1904. The new route relegated to a branch line the historic pioneer line around the north end of the lake through Promotory, where the memorable Last Spike was driven.

Probably the most expensive construction per mile was the approximately ten miles of the Bayshore cut-off between San Francisco and San Bruno which was completed at a cost of nearly a million dollars a mile to replace the old main built in 1863 through the hills south of San Francisco. Land acquisitions and other preliminaries on the project began during the few years prior to 1900. Actual construction started in October, 1904, involved extensive grading along the shore of the bay, building of bridges, and boring of five tunnels totaling nearly 10,000 feet. The line was opened December 8, 1907.

Coast Line Completed

Another link in the Coast Line route of today's famed "Daylight" streamliners between San Francisco and Los Angeles was opened March 31, 1901, when first trains operated between the two cities, making use of the Santa Paula branch between Santa Barbara and Saugus to bring trains into Los Angeles over the San Joaquin Valley line. Heavy construction had been encountered in the 150-mile section of the line north of Santa Barbara. Six tunnels in the Santa Lucia Mountains and a spectacular horseshoe curve were required before the line was opened into San Luis Obispo on May 5, 1894. Then came miles of construction along the Pacific shore, providing a beautiful scenic route but offering many engineering difficulties in completing the line into Santa Barbara. Three years passed before the Santa Susana Mountains south of Santa Barbara were pierced by three tunnels, one at Chatsworth being nearly a mile and a half long. Final link in the Coast Line was completed March 20, 1904, when traffic was routed south from Santa Barbara through Oxnard and Burbank into Los Angeles.

A stirring chapter in Southern Pacific



FIRST GENERAL OFFICE OF SP was at 4th and Townsend Streets in San Francisco. Original structure of three floors was occupied in the fall of 1873 when offices were moved from 54 K Street, Sacramento, first headquarters of the Big Four. A fourth floor added in 1877 shows in this picture taken during 1887. Executive offices were moved to uptown San Francisco in 1899. The old general office was destroyed in the SF fire of 1906.

history was enacted in the Imperial Valley during 1905-06-07 when the railroad's engineers and resources were matched against the unruly Colorado River which broke its banks and threatened to inundate much of the area that was to become one of the prolific garden spots of the world. Colonization and development had little more than gotten a start in the Valley at that time. The SP line, branching from the main Sunset Route at Niland (then Old Beach), had been completed during 1903-04 to the Mexican border at Calexico. Then came flood waters early in 1905. When attempts of the California Development Company failed to close the break, Southern Pacific was appealed to for finances and assistance. A tough battle was fought week after week, and on November 6, 1906, the river was turned back into its channel. But it was not securely harnessed. The Gila River sent flood waters into the Colorado and another break resulted on December 6, 1906, pouring the river into Salton Sea. SP's forces again went into action, this time at the personal urging of President Theodore Roosevelt. It was a case of dumping rock into the 1100-foot break faster than the rampaging river could sweep it away. From two trestles built across the chasm in the river bank, rock was handled faster than it ever had been handled before. Normal operations over 1200 miles of the railroad's main line were disrupted while some 3000 flat cars of rock were rushed from distances as far as 480 miles. About 80,000 cubic yards were dumped in fifteen days. The break was sealed on February 11, 1907. The Imperial Valley rail connection (Inter-California Railway Company) through Mexico, connecting with SP's main line near Yuma, was completed July 24, 1911.

San Francisco Disaster

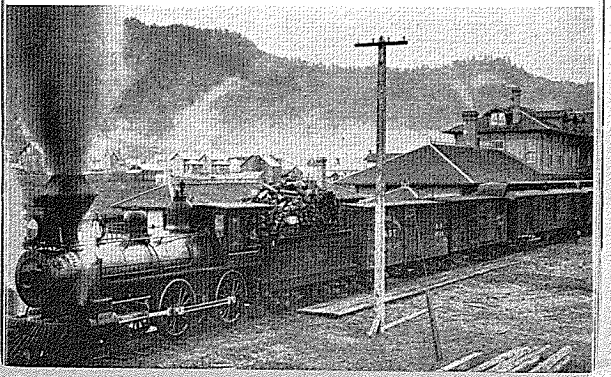
While in the midst of the battle with the Colorado River, Southern Pacific's aid was rushed to another disaster area. San Francisco's great earthquake struck early the morning of April 18, 1906, followed by three days of raging fires. Relief supplies of food, medicines and other articles were immediately collected in numerous towns and cities on the SP system and moved rapidly and continuously toward San Francisco. All movement of supplies and evacuees was done without charge. Freight trains were shortened so as to move on passenger train schedules. On April 19, 1,073 carloads of refugees were transported. All the Company's shed facilities were offered to the homeless. Explosives, stores of gasoline, etc., were issued free to city authorities. Temporary tracks were laid on city streets for removal of debris and to bring in rebuilding materials. Over 250 persons were given free care at the company's hospital. Shortly before the hospital was destroyed by fire, all patients were safely removed to nearby cities. The Company's general office and most records were destroyed. Southern Pacific gave $200,000 for relief work and in 35 days moved over 1,600 carloads of relief supplies and over 224,000 passengers free of charge.

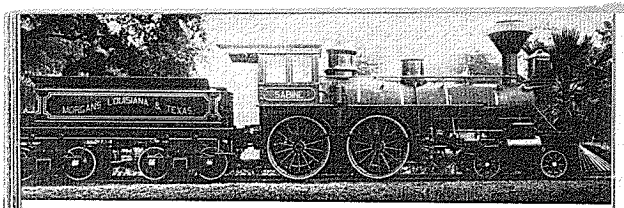
One of the most ambitious projects undertaken during the Harriman administration was the extension of the Southern Pacific lines on the west coast of Mexico south of Guaymas. Construction was started south from Empalme, junction near Guaymas, in August, 1905, also north from both Mazatlan and Orendain Jct. in 1907. In June, 1909, the Southern Pacific Railroad Company of Mexico was incorporated to carry on the work, and on February 5, 1912, through service was begun over the new 669-mile line between Empalme and Tepic. The revolutionary period, 1910-1920, halted further construction and made operation of the completed road extremely difficult. In those nine years the 105-mile section north of Tepic could be operated only five months. There remained a gap of 102 miles from Tepic to La Quemada to be built before trains could be operated to Mexico City from Nogales over the West Coast route.

Expansions 1900-1910

During the ten year period 1900-10, a total of 1,870 miles of railroad were added to the Southern Pacific system. In addition to the new lines and acquisitions already mentioned, numerous short lines were completed or under construction on the Atlantic System east of El Paso, as well as throughout the western

MIXED TRAIN AT ASHLAND not long after the Last Spike was driven there December 17, 1887, to give first through train service between Portland, Ore., and San Francisco. Large building is the station-hotel. Note cord wood piled on locomotive to give fireman workout.





LOCOMOTIVE "SABINE," a pioneer of SP's Louisiana lines, long displayed at Lafayette, La., held the spotlight at a patriotic civic ceremony in October, 1942, then was scrapped for critical war materials.

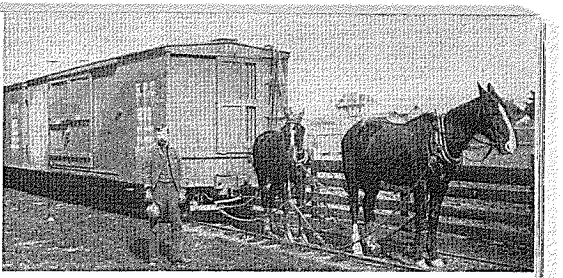
states. Only a few of these extensions can be briefly mentioned here.

Southern Pacific joined John D. and A. B. Spreckels in building a line from San Diego to connect with SP's transcontinental route at El Centro, work on which was begun in 1907. The Pacific Fruit Express Company was incorporated Dec. 7, 1906, owned jointly by SP-UP, to operate refrigerator cars. In the opening on October 22, 1910, of the rehabilitated and extended Nevada & California Railway (originating with the narrow gauge line opened in August, 1883, from Keeler, Calif., to Mound House, Nev., by the Carson & Colorado Railroad Co., incorporated, May 10, 1880) there were prospects that the through line of about 400 miles between Hazen, Nevada, on the Overland Route, and Mojave, Calif., on the San Joaquin Valley line, might eventually become a short-cut to the East for traffic out of Southern California.

The Arizona Eastern Railroad Company, formed on February 13, 1904, eventually consolidated into its organization the Arizona lines that served Phoenix and Globe-Miami, the first unit of which was the Maricopa and Phoenix Railroad Co. first operated between those two cities July 4, 1887. Another important unit was the Gila Valley, Globe and Northern, whose line from Bowie to Fort Thomas was opened May 1, 1895, reaching Globe on December 1, 1898, and Miami late in 1909.

Through consolidation of seven short lines operating steam and electric service in the north coast counties of California, the Northwestern Pacific Railroad Company was formed January 8, 1907, under joint ownership of the SP and Santa Fe, to complete construction and weld the various units into one property extending from Sausalito and Tiburon on San Francisco Bay through San Rafael, Santa Rosa and Ukiah to Eureka and Trinidad, together with ferry boat service to San Francisco. Final 106-mile link through Eel River canyon between Willits and Shively was completed with a "last spike" ceremony October 23, 1914, but it was July 1, 1915, before the through line was opened to traffic. Pioneer unit of the NWP dates from Charles Minturn's 2½-mile horse-powered rail line of 1864 from Petaluma to Haystack Landing where it connected with ferry boats to San Francisco. Among other early companies was Peter Donahue's 1870 railferry service from Santa Rosa to Donahue Landing and San Francisco. (January 17, 1929, SP acquired full ownership of the 515-mile NWP railroad and its ferry boats.)

Southern Pacific became interested in a number of steam and electric line projects in Oregon. Most important of these properties were the 141-mile Corvallis & Eastern line from the coast port of Yaquina across the state through Corvallis and Albany to Idanha, built



HORSES WERE MOTIVE POWER on the three-mile Newark-Centerville (Cal.) branch of the old South Pacific Coast railroad. The branch connected with the Alameda-San Jose-Santa Cruz main line of the 100-mile narrow gauge system, which included ferry service across San Francisco Bay, and which was acquired by SP in 1887. Horse power was used exclusively on the branch from its opening in 1882 to abandonment in 1909.

during 1885-89, and acquired by SP in 1907; the Coos Bay, Roseburg and Eastern, whose short line from Myrtle Point into Marshfield was extended 122 miles to Eugene by the Willamette Pacific and opened to traffic October 1, 1916; the Portland, Eugene & Eastern, incorporated in 1907 to build and acquire lines in the Willamette Valley which were later electrified; and the Pacific Railway & Navigation Company which started building between Hillsboro and Tillamook in 1905-06, but was not opened for through traffice until Jan. 1, 1912.

On the Atlantic System during the 1900-10 period, 160 miles of the Dallas-Sabine branch in Texas were constructed between Rockland and Gossett to provide a through Beaumont-Dallas line.

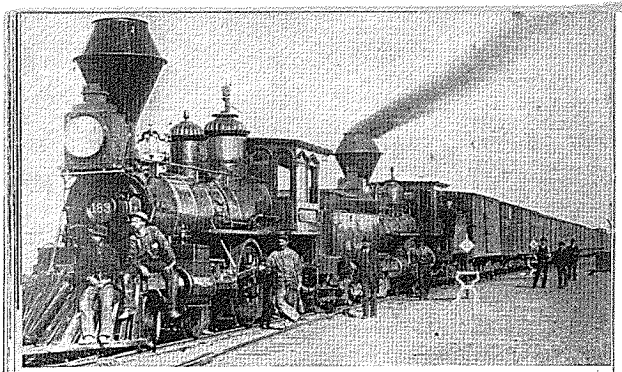
Other companies were formed to acquire existing properties and to build extensions, a large portion of which work was delayed pending outcome of suits instituted by the government to separate the Southern Pacific-Union Pacific system.

Government Suits

The Sherman Anti-Trust law of 1890 was the basis of two suits, the government contending that Union Pacific's control of Southern Pacific through stock ownership was in violation of the law, and also that Southern Pacific's control of Central Pacific was illegal.

The first suit involving the Union Pacific-Southern Pacific was begun Febru-

OAKLAND LONG WHARF AND MOLE as they appeared in 1890. The two-mile wharf was opened Jan. 16, 1871, with slips for the passenger ferry "El Capitan" and the freight car transfer ferry "Thoroughfare," also berthing space for four ocean vessels and storage warehouses. Five docks with berth space for 22 vessels were added later, where for nearly six decades the ships of the Seven Seas met the transcontinental railroad. Long Wharf handled freight exclusively after Oakland Mole passenger terminal was opened Jan. 22, 1882. It was abandoned in 1918-19 when freight docks and sheds were built adjacent to present Oakland Pier.



PREDECESSORS of modern refrigerator cars were in this train, said to be the first solid train of fruit to leave California, photographed in 1884 with Central Pacific locomotive 183 on headend.

ary 1, 1908, and in reversing a lower court's decision, the U. S. Supreme Court on December 2, 1912, held that the ownership of 46% of the outstanding stock of the SP by the Union Pacific was in contravention of the Sherman Act. Arrangements for disposal of the stock and divorce of UP from control of the SP was approved by the court June 30, 1913.

The government's suit to force SP to sell all its stock in the pioneer Central Pacific was begun February 11, 1914. The U. S. District Court decided in favor of the railroad on March 9, 1917, but, on the government's appeal, that decision was reversed and decision rendered against the SP on May 29, 1922. Meantime, Congress had passed the Transportation Act of 1920 which conferred power upon the Interstate Commerce Commission to authorize any carrier to acquire control of another carrier by lease or stock ownership, such control being relieved from operation of the Sherman Act. SP applied to the ICC in October, 1922, and after an extended hearing, the Commission on February 6, 1923, approved SP's control of the Central Pacific as being "in the public interest." The court recognized the ICC decision, and in August, 1923, the suit was ended.

CHAPTER 4

World War I and More Construction

AMERICA'S entry into the first World War (April 6, 1917) found Southern Pacific's management immediately alert to the gigantic transportation task it would be called on to perform with other railroads. Less than a week after war was declared the nation's railroad executives had organized the Railroads' War Board to coordinate operations of the country's rail facilities. William Sproule, who had been president of SP since Sept. 25, 1911, became chairman of the Western Department of the Board, which took over functions of the National Car Service Commission, organized by the American Railway Association on December 5, 1916, to unify and regulate flow of freight cars.

However, in spite of all the railroads' efforts, the system of war priorities for government freight jammed loaded freight cars into many areas throughout the country, particularly at Atlantic ports where hundreds of thousands of cars could not be unloaded because of a shortage of ships and a lack of port warehouses or storage space. Hundreds of carloads of freight were also tied up at construction projects where work was not advanced sufficiently to make use of the materials. Congestions and car shortages were the inevitable result, not because the railroad plants were inadequate if put to their proper use, but because their equipment and trackage were used for storage instead of transportation purposes.

Government control and operation of the nation's railroads became effective at noon on December 28, 1917. There were no changes in Southern Pacific's officer personnel or subdivision of territory until July 1, 1918, when President Sproule was named by the U. S. Railroad Administration as district director of the lines of all railroads west of Ogden, Salt Lake City, Albuquerque and El Paso, and south of Ashland, Ore., in what was called the Central Western Region. This segregation placed SP's Oregon lines in the Northwestern Region, and its Texas and Louisiana lines in the Southwestern Region. Julius Kruttschnitt, chairman of SP's executive committee, was elected to the additional duties of corporate president to succeed Sproule.

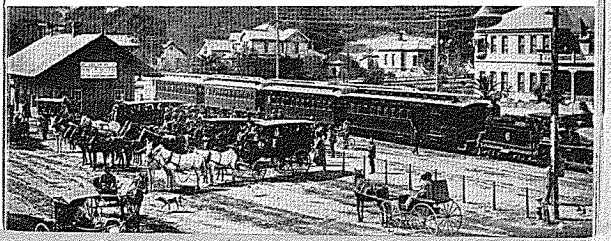
W. R. Scott, then vice president and general manager of SP's Pacific Lines, became federal manager over the remainder of the Pacific Lines as well as of the Western Pacific properties in the Central Western Region.

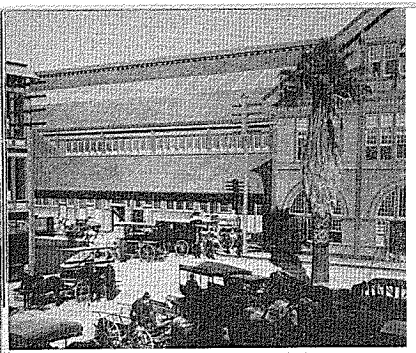
Over SP lines and elsewhere throughout the country, railroad facilities were consolidated, in some respects, for unified operations. As examples, SP and Western Pacific trains made joint use of each other's tracks through a portion of Nevada, and Oakland Pier terminal was used jointly by the SP, WP and Santa Fe. Ticket offices were consolidated in many cities and off-line traffic offices were closed.

The war ended less than eleven months after the government took over the railroads, but the properties were not returned to private operation until 12:01 a.m., March 1, 1920, making a total of approximately 26 months under federal control. Sproule resumed his prewar SP position, and Scott became president of the lines in Texas and Louisiana.

Out of wartime operations the railroads, the government and the nation's shippers gained valuable experiences. The need of organizational set-ups to work out a program for efficient, smooth functioning of railroad services was ob-

IN EARLY DAYS of railroading trains were usually met by a swarm of stages, buggies and bicycles such as at this South Pacific Coast station at Los Gatos.





ARCADE STATION, passenger terminal of SP in Los Angeles, as it appeared during the early '90's. Opened Dec. 31, 1888, it was replaced when SP erected Central Station and opened it for business June 12, 1915. All passenger operations were transferred to the new LA Union Passenger Terminal when it was opened to the public on May 7, 1939.

vious. The American Railway Association, founded in October, 1891 (predecessor of today's Association of American Railroads, organized in September, 1934), coordinated many phases of operations and practices, particularly in the handling of freight cars through the association's Car Service Division to avoid car shortages and congestion during heavy traffic situations. The government, through its military, naval and other agencies; and the shippers, through thirteen Regional Shippers Advisory Boards, perfected rail transportation procedures in a highly coordinated degree of teamwork with the railroads that was to pay off handsomely some twenty years later when rumblings of another war emergency gripped the nation.

Aftermath of War

When Southern Pacific regained control of its properties in March, 1920, it faced, in common with all other railroad companies, abnormal operating conditions. There were many problems to be solved, the most acute being a shortage of serviceable cars and locomotives. Little new equipment had been built because of war restrictions on labor and materials. Every car and locomotive that could roll had been subjected to heavy and continuous service and much shop work was necessary. There was an unusual dislocation of equipment with heavy concentrations of cars in the eastern territory.

To get the greatest service possible out of existing equipment and facilities, Southern Pacific intensified the wartime campaign for heavier loading and prompt unloading of freight cars, getting fine results through cooperation of shippers. Repair work in shops was moved into high gear, and orders were placed for many millions of dollars worth of new equipment. This move for early strengthening of SP's capacity was coupled with a vast long-range program of rehabilitation and development.

In most of its major aspects this program was a continuation of the construction that had been started, or projected, in the 1900's before the government suits under the Sherman Anti-Trust Act, and then the war, brought the railroad's expansion to a virtual standstill. The program was launched under direction of Kruttschnitt, who had intimate knowledge of many of the projects from their very inception, having been director of maintenance and operations for the combined SP-UP system from April, 1904, and then chairman of SP's executive committee after succeeding R. S. Lovett on January 13, 1913. The $387,000,000 gross expenditures for road extensions, additions and betterments, made during the eight years before the depression era swept the nation, surpassed any similar period in the Company's history.

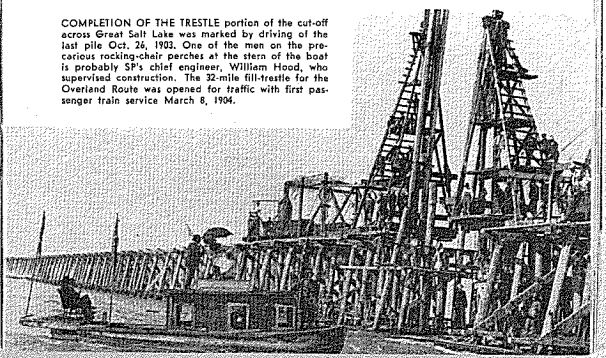
Set Pace for Prosperity

Keynote of the entire rehabilitation program was sounded in the placing of a single order for fifty heavy duty 2-10-2 type locomotives, twenty of which rolled across the continent from Baldwin's plant near Philadelphia in a solid train aptly called the "Prosperity Special."

The sensational train, acclaimed by the press as heralding a national upswing in business and industrial activities, reached Los Angeles on June 10, 1922. In the five-year period of 1920-24, more than $105,000,000 was spent for locomotives, freight and passenger cars, and other equipment, some of which were built in the company's shops.

During 1923 and the seven years immediately following, Southern Pacific had more new construction in hand than any other railroad in the country. Four major projects completed at an aggregate cost of $76,000,000 were: Cascade Line (Natron cut-off), through Klamath Falls, Ore., $39,000,000, including expenditures for the beginnings of this project dating from 1905; new line Klamath Falls to Alturas, Cal., and rebuilding of the Nevada-California-Oregon line to standard gauge, $9,000,000; new line in Arizona through Phoenix, $14,000,000; and completion of the Mexico line, $14,00,000.

The 270-mile Cascade Line between Black Butte, Cal., and Natron, Ore., opened to freight and local passenger traffic on September 1, 1926, and to all through traffic on April 17, 1927, provided a route with lighter grade, less curvature, and 25 miles shorter than the original line built over the Siskiyou Mountains during the late '80s. This project had its beginning when the Oregon Eastern was organized by SP in August, 1905, to build east from near Eugene across the Cascades. The intention was to connect with the Union Pacific but the litigation that separated the SP-UP properties caused a change



COMPLETION OF THE TRESTLE portion of the cut-off across Great Salt Lake was marked by driving of the last pile Oct. 26, 1903. One of the men on the precarious rocking-chair perches at the stern of the boat is probably SP's chief engineer, William Hood, who supervised construction. The 32-mile fill-trestle for the Overland Route was opened for traffic with first passenger train service March 8, 1904.

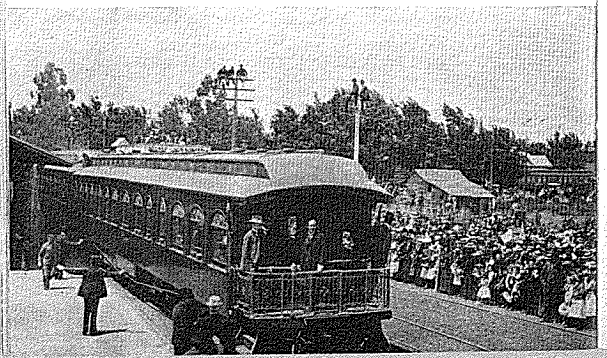
in the routing as well as delayed construction. Work was begun at Natron, near Eugene, in August, 1909, and the line, commonly referred to as the Natron cut-off, was opened to Oakridge in May, 1912. The California portion of the Cascade Line originated in the California Northeastern, incorporated in July, 1905, to reconstruct a logging road built by the Weed Lumber Co. during 1903-05 from Weed to Grass Lake, and to extend the line to Klamath Falls. The road was opened for traffic to Klamath Falls in May, 1909, and to Kirk, Ore., in September, 1912. Work stopped there until construction was resumed in September, 1923, to complete the 108-mile gap between Kirk and Oakridge. Also involved in the finally completed Cascade Line was a 24-mile line change around the base of Mt. Shasta between Black Butte and Grass Lake, Cal., replacing the original section of line northward out of Weed.

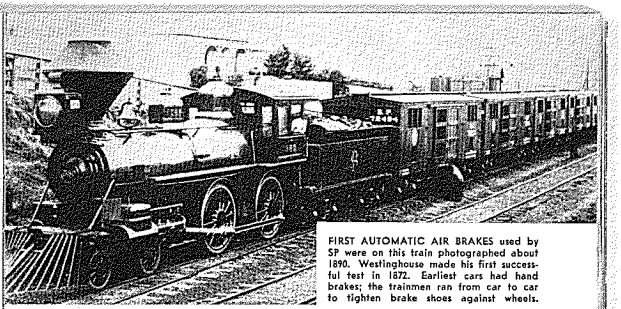
The 278-mile Modoc Line, opened for traffic on September 15, 1929, was created by building from Klamath Falls 96 miles to Alturas and rehabilitating the N-C-O-narrow gauge from Alturas to a connection with SP's Overland Route in Nevada. This new transcontinental link brought Oregon and certain northern California regions about 200 miles closer to markets of the East.

Other Affiliated Companies

The Central California Traction Company began local electric streetcar service in Stockton in May 1906. The following year a line was built to Lodi, and the line from Lodi Jct. to Sacramento was placed in operation on September 1, 1910. In 1928, Southern Pacific, Santa Fe and Western Pacific each acquired one-third of the stock and bonds of the company. At the same time, the streetcar lines in Stockton were sold to the Stockton Electric Railroad Company (which had operated them under lease for many years). Passenger operations were discontinued in February 1933. Electric operations ceased in December 1946, and the line, 54 miles long, became diesel powered.

PRESIDENTIAL TRAINS which move over Southern Pacific attract gay and colorful crowds like the one here greeting President McKinley at Stockton May 25, 1901, but not many of the spectators match the enthusiasm of the eager onlookers perched on "preferred seats" atop the telegraph poles.





FIRST AUTOMATIC AIR BRAKES used by SP were on this train photographed about 1890. Westinghouse made his first successful test in 1872. Earliest cars had hand brakes; the trainmen ran from car to car to tighten brake shoes against wheels.

Holton Inter-Urban Railway Company, extending 10.47 miles between El Centro and Holtville in the Imperial Valley of California, was opened in October 1904. Southern Pacific bought the company in January 1926.

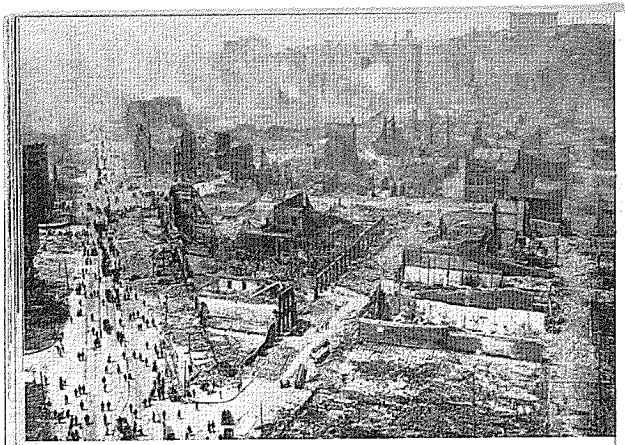
The Sunset Railway, extending from Gosford to Taft and Maricopa (Bakersfield is reached by trackage rights), was built in 1901 and 1904 by the Southern Pacific and Santa Fe as joint owners.

New Southwest Lines

The new line through Phoenix, opened to traffic on November 14, 1926, together with the 1139 miles of the El Paso & Southwestern system which had been consolidated with SP on November 1, 1924, gave SP a second main line across Arizona and New Mexico as far as El Paso. The EP&SW properties extended from Tucson through Douglas and El Paso to Tucumcari, N. M., with important branch lines in the two states. Phelps, Dodge & Company, extensive mining and smelting operators, developed the line dating from the Arizona and Southeastern opened in May, 1888, to haul ore and other traffic from Copper Queen mine at Bisbee to a connection with the Sonora Railway extension at Fairbank. Subsequent construction carried the EP&SW main line into the newly-founded city of Douglas in 1901, to El Paso on June 30, 1903, and to Tucson on November 25, 1912. The extension from El Paso to Santa Rosa was completed in February, 1902, connecting with the Rock Island from Tucumcari, and the EP&SW's Tucumcari-Dawson line was completed January 31, 1903.

Some of the heaviest railroad construction ever undertaken was involved in completing the final 102 miles of the line in Mexico. Volcanic formations of the rugged Barrancas were particularly tough. Thirty-two tunnels were bored, and on one section of the work more than 4000 Mexican laborers were employed. As part of this through line, 23 miles between Orendain Jct. and Guadalajara were leased from National Railways of Mexico. On April 17, 1927, first trains were operated over the 1095-mile through line from Nogales to Guadalajara, where connection was made for Mexico City. (This entire line was sold to the Mexican Government, December 21, 1951.)

In addition to the construction of these important main line units, the expansive improvement program of 1923-30 included a multitude of other projects, only a few of the larger items of which can be mentioned here.



WHEN SAN FRANCISCO WAS STRUCK by a devastating earthquake and fire April 18, 1906, all the facilities of Southern Pacific's vast transportation plant were made available, without charge, to the city's disaster authorities. In 35 days more than 1600 carloads of relief supplies were moved into the stricken area and 224,000 evacuees moved out. This picture, looking up Market Street from Ferry Bldg. tower, shows site (second block on left) of SP's present General Offices. After 1906 SP offices were for many years in the Flood Building farther up Market Street.

When the EP&SW joined SP in 1924, the Nacozari Railroad, operating 76.55 miles in Mexico (built in 1901) was acquired.

The Inter-California Railway Company, operating in Mexico between Mexicali and Algodones (51.67 miles), was built in 1907-1909. A 2.7 mile line to Araz Jct., on SP, built in 1911, replaced a line to Handon Jct., built in 1909, to provide a short route to the East from the Imperial Valley. From Pascualitos, eight miles east of Mexicali, the construction of another railroad began in 1924 to serve an agricultural area near the mouth of the Colorado River. In 1929, the Inter-California Southern Railway took over the project, and the line was completed to Flowing Wells (now Medanos) across the Colorado River on October 20, 1931. Southern Pacific purchased control in 1930 and sold the company to the Mexican Government on June 23, 1941. It now forms part of the Sonora-Baja California Railway.

Double-tracking and strengthening the capacity of the Overland Route, particularly over the Sierra Nevada mountains, was one of the major jobs resumed in 1923. The project was begun in 1906 and nearly 200 miles of second track had been completed at various points between Sacramento and Ogden by the time work was suspended in 1914. Biggest single project in connection with the Sierra double-tracking was construction of the Summit tunnel of 10,326 feet, longest on SP lines, which was completed during 1925. To further expand double track operations on the Overland Route, an agreement was made with the Western Pacific on August 1, 1924, for joint use of that company's 178-mile line between Alazon and Weso in Nevada. Double-tracking was completed at other points over the system, particularly on sections of the Tehachapi mountain line during 1922-23 and 1928-29, and on sections of the Coast Line between San Jose and Watsonville Jct. during 1927-30.

Several of the larger freight classification yards were expanded. First units of the new Taylor Yard at Los Angeles, which was to eventually total 250 miles of trackage, were completed during 1922-23. Other facilities, including subways and an office building, were added in 1926, and an engine terminal was completed at Taylor Yard during 1929-31. At Fresno a new freight classification yard, PFE icing station, and 15-mile freight line between Kerman and Biola Jct., were major units of a big project completed in 1929-30. During 1925-26-27 considerable trackage and other facilities were added to the Roseville terminal, where PFE completed its car repair shops and storage track extensions in 1927. An extensive freight yard terminal was constructed at Santa Clara, Cal., during 1926, with additional facilities completed 1928-29. Construction on a large terminal yard at Eugene, Ore., was begun in 1923 and the last unit completed during 1929.

At Yuma a single span 400-foot steel bridge was constructed across the Colorado River during 1923, about 1300 feet upstream from the former crossing. Involved in this change of line was a new terminal yard and 11 miles of double track extending five miles east of Yuma to the East Yard and six miles west to Araz Jct. These terminal changes were progressively constructed and completed during 1928.

New Stations

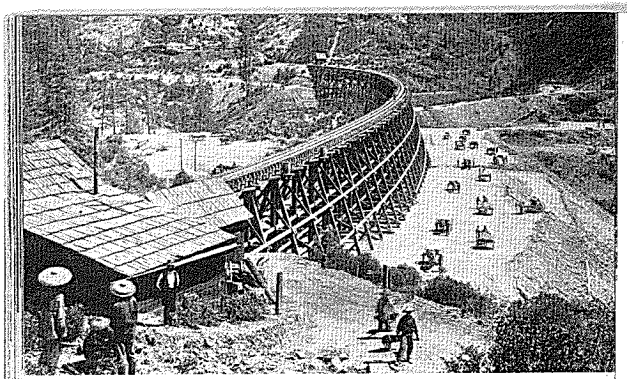
Outstanding among new passenger stations completed in the 1923-30 period, were: Glendale, Ogden Union station, and Phoenix Union station in 1924; Sacramento, Reno and Yuma, in 1926; and Stockton in 1930. A new freight station was completed at Bakersfield in 1927.

The 16-mile narrow gauge line of the Lake Tahoe Railway and Transportation Co., originally opened between Truckee and Lake Tahoe in May, 1899, was leased October 16, 1925, rebuilt to standard gauge and opened for traffic May 1, 1926. (This line was abandoned in 1943.)

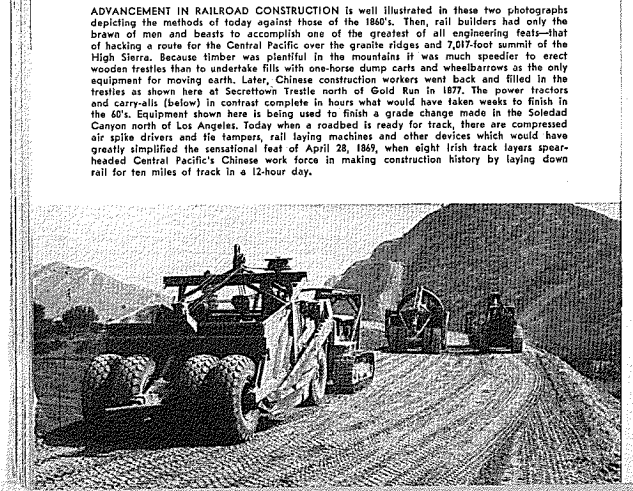
The Oregon, California & Eastern Ry., from Klamath Falls to the Sprague River in southern Oregon, was purchased July 22, 1927, and a half interest subsequently sold to the Great Northern. An extension to Bly was completed on April 30, 1929, giving the road a total of 65 miles.

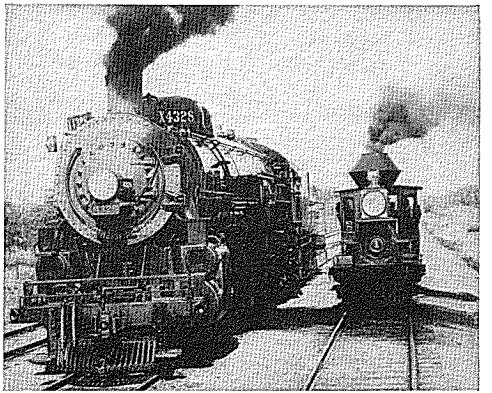
Construction was begun in May, 1929, on the $10,000,000 5603-foot double-

COLORADO RIVER went on rampages in 1905-06-07, threatening to inundate what is now the prolific Imperial Valley. Worse break came late in 1906, when SP's engineering forces staged epic battle to plug an 1100-foot gap in the river bank and turn the surging stream back into its channel. This picture shows some of the 3000 cars of rock dumped into the chasm, rushed to the scene from distances of nearly 500 miles.



ADVANCEMENT IN RAILROAD CONSTRUCTION is well illustrated in these two photographs depicting the methods of today against those of the 1860's. Then, rail builders had only the brawn of men and beasts to accomplish one of the greatest of all engineering feats—that of hacking a route for the Central Pacific over the granite ridges and 7,017-foot summit of the High Sierra. Because timber was plentiful in the mountains it was much speedier to erect wooden trestles than to undertake fills with one-horse dump carts and wheelbarrows as the only equipment for moving earth. Later, Chinese construction workers went back and filled in the trestles as shown here at Secrettown Trestle north of Gold Run in 1877. The power tractors and carry-alls (below) in contrast complete in hours what would have taken weeks to finish in the 60's. Equipment shown here is being used to finish a grade change made in the Soledad Canyon north of Los Angeles. Today when a roadbed is ready for track, there are compressed air spike drivers and tie tampers, rail laying machines and other devices which would have greatly simplified the sensational feat of April 28, 1869, when eight Irish track layers spearheaded Central Pacific's Chinese work force in making construction history by laying down rail for ten miles of track in a 12-hour day.



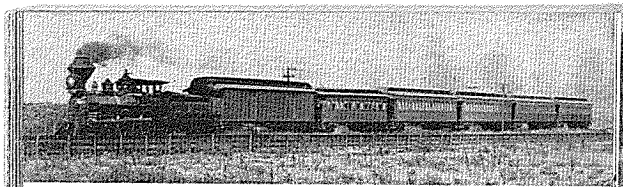


SIXTEEN TIMES MORE POWERFUL than the pioneer "C. P. Huntington" woodburner (right) of the early '60's, locomotive 4328 was the first of 49 of the 4-8-2 types built at SP's Sacramento shops during 1925-30. This oilburner was placed in service during September, 1925. When final one of this series was turned out in March, 1930, it was the last locomotive construction performed by SP in its own shops; first one was October, 1872.

track Martinez-Benicia bridge across Suisun Bay, 35 miles from San Francisco, the longest and heaviest railroad bridge west of the Mississippi. First trains were operated across the span on October 15, 1930. Its completion made possible the abandonment of the world's two largest car-transfer ferry steamers, the "Solano" and "Contra Costa," which for many years had carried freight cars and entire passenger trains across Carquinez Straits between Port Costa and Benicia.

To the properties in Texas and Louisiana, the 40-mile line of the Franklin and Abbeville Ry. Co., serving a Louisiana sugar refinery and plantation, was added in November, 1924. Control of the Dayton-Goose Creek Ry. Co., a 25-mile line from Baytown, Texas, to connection with the T&NO at Dayton, Texas, was acquired through stock ownership on May 1, 1926; and in the same manner control of the 125-mile Texas Midland Railroad from Ennis to Paris, Texas, was acquired on April 1, 1928. An important piece of construction in Texas, principally to overcome serious washouts, was the replacing of the old line of nearly 14 miles between Langtry and Osman, with a new line less than ten miles in length.

The San Antonio and Aransas Pass Ry. Co. was re-acquired on April 8, 1925, and operated in consolidation with SP's Texas lines. SP had control of the capital stock and guaranteed the principal and interest on the first mortgage

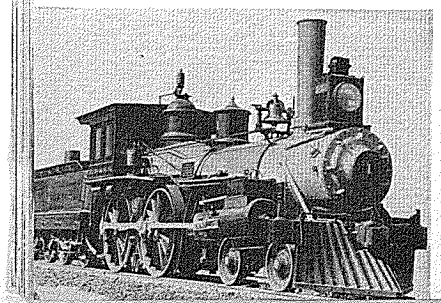


BACK IN THE '80's this was a high standard coach train on the Coast Line south of San Francisco. The picture was taken during 1884 near Oak Park, now Burlingame. Brand new that year, the four-wheeled woodburner weighed 92,000 lbs., developed 12,500 lbs. tractive power, stepped right along with train of 50-ft. wooden cars.

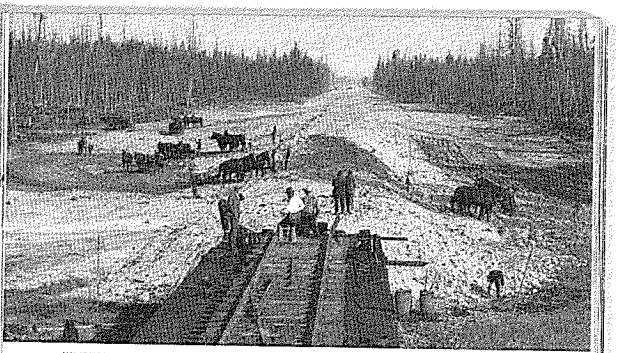
bonds of this company up to 1903, when a court decree required SP to relinquish its control. The SA&AP's 725 miles of Texas lines extended from Waco on the north, Kerrville on the west, and Houston on the east, to Falfurrias and Corpus Christi on the south. During 1926-27 this property was extended approximately 135 miles into the Rio Grande Valley, the new line from Falfurrias through Edinburg to McAllen being placed in complete service in February, 1927, also 15 miles of the line east of Edinburg opened to freight traffic. Remaining portion of the line, Edinburg through Harlingen to Brownsville, was opened to freight service on October 20, 1927, and to passenger service the following November 10.

Important subsidiary and affiliated companies operating on Pacific Lines before the end of 1929 to carry on specialized phases of the railroad's varied transportation services, were: Southern Pacific Golden Gate Ferries, Ltd., in May, 1929, handling ferry boat vehicular traffic between several points on San Francisco Bay; the Southern Pacific Motor Transport Company, in April, 1927, operating motor passenger coaches on highway routes; and the Pacific Electric Motor Transport Co., in Mar., 1929, experimenting with motor trucks operating in conjunction with freight trains in delivery of less-than-carload freight from store-door of the shipper to store-door of the receiver.

Chief executives who supervised SP's affairs in the period before the dark days of the depression struck in 1930, other than the already mentioned Kruttschnitt and Sproule, were: Henry W. de Forest, who succeeded Kruttschnitt as chairman of the executive committee



EL PASO & SOUTHWESTERN'S No. 1 locomotive was built in 1857 and first used in Arizona on pioneer unit of EP&SW between Bisbee and Fairbank in 1889. The EP&SW properties, serving expansive mining regions in Arizona and New Mexico, was completed in 1912 and acquired by SP in 1924. Historic engine is kept on display in El Paso.



JUMPING-OFF SPOT for construction of the final 108-mile link in the Cascade Line was at Kirk, Ore., 41 miles north of Klamath Falls in September, 1923. Roadway through heavy forests and over difficult mountain terrain to Oakridge was opened Sept. 1, 1926.

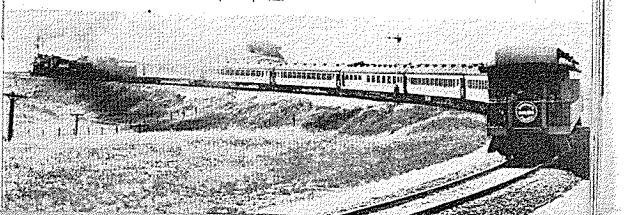
on June 1, 1925; Hale Holden, who succeeded de Forest on January 1, 1929; Paul Shoup, who succeeded Sproule as president on January 1, 1929; and A. D. McDonald, who had become vice chairman of the executive committee on June 1, 1925, assuming the added duties of president of the Southern Pacific lines in Texas and Louisiana (formerly referred to as the "Atlantic system lines") in 1926 and supervision of the S. P. Steamship Lines in January, 1929.

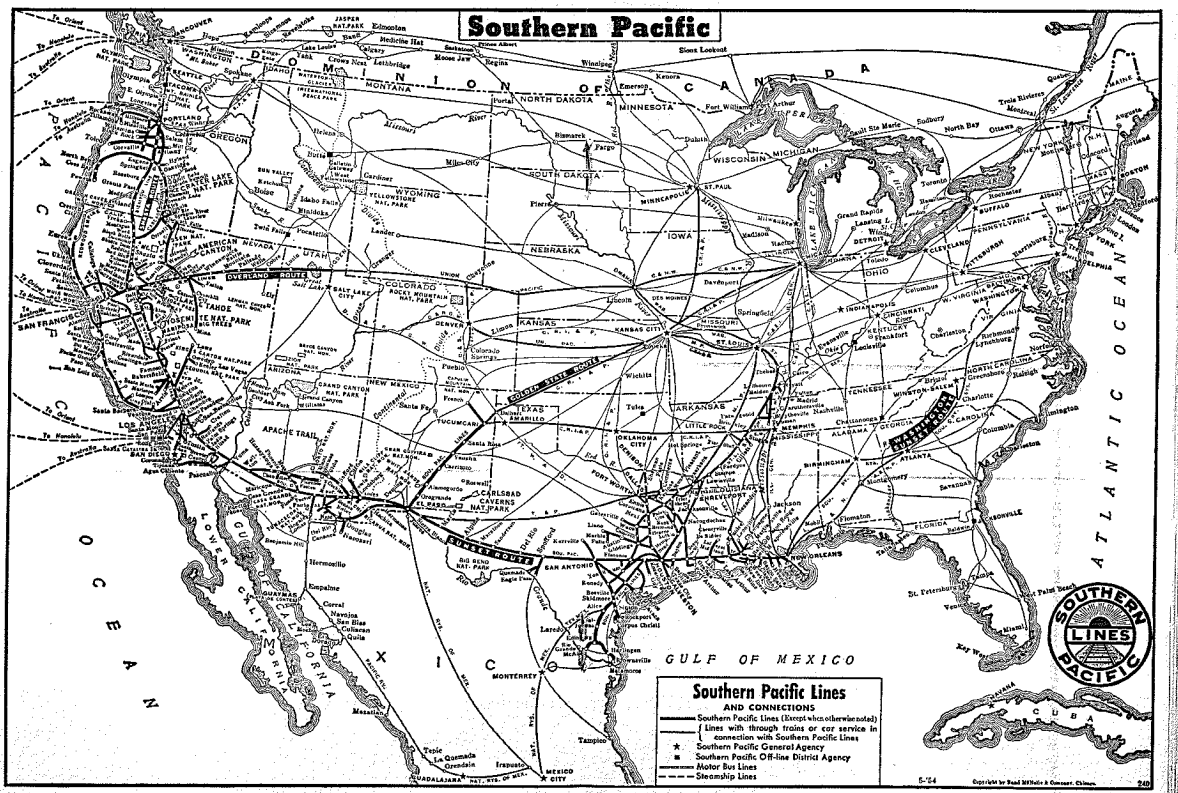
CHAPTER 5

Depression and Recovery Before World War II

OPERATING revenues of the SP in 1928-29 were higher than ever before. In 1930 they dropped to the lowest in ten years as a result of the nationwide business depression. For another two years freight revenues continued dropping. Passenger revenues dropped for another

"DAYLIGHT" of 1930 was painted silver gray to deflect sun rays and add to travel comfort. It operated on a 12-hour schedule and marked another in a series of progressive moves to provide high standard of coach service between San Francisco and Los Angeles. The first "Daylight" was operated on April 28, 1922.




Southern Pacific
DOMINION OF CANADA
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
LOWER CALIFORNIA
MEXICO
CUBA
OVERLAND ROUTE
SUNSET ROUTE
GOLDEN STATE ROUTE
APACHE TRAIL
SOUTHERN PACIFIC LINES
Southern Pacific Lines
AND CONNECTIONS
Southern Pacific Lines (Except where otherwise noted)
Lines with through trains or car service in connection with Southern Pacific Lines
Southern Pacific General Agency
Southern Pacific Off-line District Agency
Motor Bus Lines
Steamship Lines
5-'64
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HOUSTON'S fine Southern Pacific passenger station is shown here at about the time the one-million-dollar project was placed in service on September 1, 1934.

three years before the slow upswings began.

Many retrenchments were necessary in this period, including organizational economies and the lopping off of unprofitable services. Total employment on the Transportation System in 1933 averaged only 45,362 compared with 89,304 in 1929 (based on monthly averages). Dividends to stockholders were discontinued after the last quarterly payment of 1931, the first missed since payments began in 1906, when there also was preferred stock. (Dividend payments were resumed on December 21, 1942.)

Four operating divisions were consolidated with others. The New Mexico was added to the Rio Grande, July 27, 1930; Western took over the East Bay Electric on October 16, 1930, also the Stockton Division on May 1, 1931; and Shasta Division was linked to Sacramento Division on September 15, 1932. (Shasta was restored as a separate division July 1, 1941, when wartime traffic became exceptionally heavy.)

A new executive set-up became effective August 1, 1932, to simplify and adjust the official management more closely to current conditions. A new position of chairman, Southern Pacific Company, was created to place control and direction of the Company's affairs in a single authority. Hale Holden became chairman, and Paul Shoup, vice chairman, at New York; A. D. McDonald was elected president, to have jurisdiction over all rail and steamship lines, and other properties of the Company, with offices at San Francisco and Houston.

New Era in the '30s

Despite low revenues and the necessity of effecting rigid economies, a progressive and competitive spirit was evidenced. SP pioneered and led the way in numerous innovations and improvements in service that marked a new era in railroading during the '30s.

Notably, motor truck store-door pick-up and delivery of less-than-carload freight was expanded to include highway operations in conjunction with fast overnight merchandise freight trains. This was the era that brought air conditioning, the greatest boon to travel since railroading began, and with it SP introduced many features to attract passenger business. These will be described more fully further on.

Some of the projects underway when the depression hit were carried to completion. Among them were: SP's first installations of Centralized Traffic Control (an improved form of train dispatching) in April 1930 between points near Stockton and Sacramento, California; installation of automatic block signals on all primary main lines, completed in 1931 to give SP more road-miles protected by this safety device than any other railroad in the country; completion on June 1, 1931, of a new double-track freight line on the east side of the Los Angeles River to route freight trains around the business district of Los Angeles; and a $3,250,000 track relocation and station project at San Jose, California, involving eight grade separations, completed December 31, 1935.

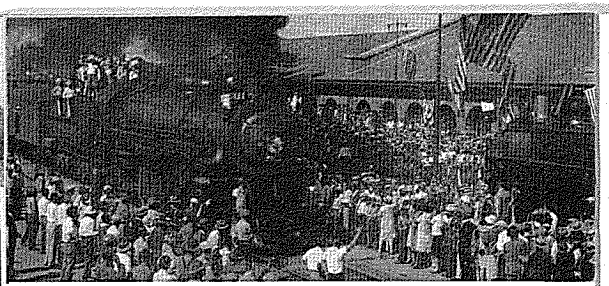
Cotton Belt Acquired

Capital stock control of the 1800-mile St. Louis Southwestern Railway (Cotton Belt) was approved by the I.C.C. on April 14, 1932. With St. Louis as the northern terminus, lines of the Cotton Belt are operated in Illinois, Missouri, Tennessee, Arkansas, Louisiana and Texas, making various connections with SP's lines in Texas and Louisiana, particularly at Dallas, Corsicana and Shreveport. The property has remained in operation under its own, or trustee, management. (In 1947 reorganization proceedings of the St. Louis Southwestern Railway Company were dismissed and the properties were returned to that company after 12 years of management by trustee. As of December 31, 1954, Southern Pacific held an 88.41 per cent stock ownership.)

Another Southern Pacific acquisition during 1932 was that of the Petaluma and Santa Rosa Railroad Co. with 37 miles of electric freight lines serving an intensively developed agricultural section of Sonoma County, California. Control of the rail properties, two small freight steamers and a line of barges operating between Petaluma and San Francisco, was acquired by the Northwestern Pacific. (The Petaluma and Santa Rosa Railroad, operating 31.5 miles, was by 1955 completely dieselized, and its freight steamers had been replaced by a tugboat and covered barges.)

In 1907 Southern Pacific and the Spreckels interests began construction of the San Diego and Arizona Railway between San Diego and El Centro, California. The difficult and costly engineering work was still underway when the first World War broke. In order that work could continue, the road was released from federal control, the only railroad in the country so released. It was opened to through traffic on Decem-

"PROSPERITY SPECIAL" was the name appropriately given SP's special train of twenty 2-10-2 locomotives, first of 50 ordered, which rolled across the continent in June, 1922, heralding upswing in national prosperity.



PHOENIX CELEBRATED when partial completion of SP's second main line across Arizona was observed there October 15, 1926, when special trains brought visitors from San Francisco, Los Angeles, San Diego, Yuma and other points for ceremonies at union station.

ber 1, 1919. Various branches, including lines to Coronado and El Cajon, some dating from 1887, were acquired in 1917. On February 1, 1933, SP acquired full ownership of the 200-mile line, including the Tiajuana & Tecate Railway, extending through 44 miles of Mexico, by purchasing the portion of capital stock held by the Spreckels interests. The name was changed to San Diego & Arizona Eastern Ry. Co. Passenger service was discontinued in January, 1951. Freight trains are now predominantly diesel powered.

Texas-Louisiana Lines Merge

To simplify the corporate structure, and to effect substantial economies, the several corporations comprising SP's lines in Texas and Louisiana merged their 12 operating companies into the already existing Texas and New Orleans Railroad Co., effective June 30, 1934.

An important change in the entry of SP trains into New Orleans began December 17, 1935, when passenger and freight trains were routed for the first time over the impressive Huey Long 4.4-mile public highway and railroad bridge across the Mississippi River.

SP's guarantee of a minimum payment of train tolls was an important factor in financing the structure. The ferrying of passenger trains across the river was discontinued between Avondale and Harahan, and of freight trains between Algiers and New Orleans. New terminal facilities at Avondale replaced the old yard at Algiers, which had been the railroad terminal for 80 years. A new passenger station at Houston, with related facilities, was completed at a cost of over one million dollars and opened for use on September 1, 1934.

Construction of the $11,000,000 Los Angeles Union Passenger Terminal, one of the finest passenger stations in the nation, was begun late in 1933 under joint agreements by the SP, Union Pacific, and Santa Fe. It was opened on May 7, 1939, and new facilities, including SP's Mission Road Coach Yard, were placed in service. With its completion, SP's Central Station, opened in July, 1915, was closed as a passenger terminal.

Southern Pacific ferry boat operations and interurban electric train service across San Francisco Bay were vitally affected by the opening of the world's biggest and longest, 8¼-mile $77,000,000 San Francisco-Oakland Bay Bridge to vehicular traffic on November 12, 1936, and to electric interurban train traffic on January 15, 1939. They were affected also by the $35,000,000 Golden Gate Bridge, with world's longest single span (4,200 feet), opened to vehicles on May 28, 1937.

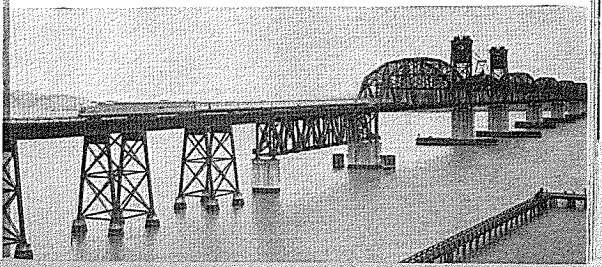
The two subsidiaries handling this traffic for SP were the Interurban Electric Ry. Co., which on March 23, 1936, took over the electric interurban service and dealt with the California Toll Bridge Authority for later operations over the bridge; and the Southern Pacific Golden Gate Ferries, Ltd., a partially owned affiliate, which in May 1929, began operation of auto and vehicular ferry boats.

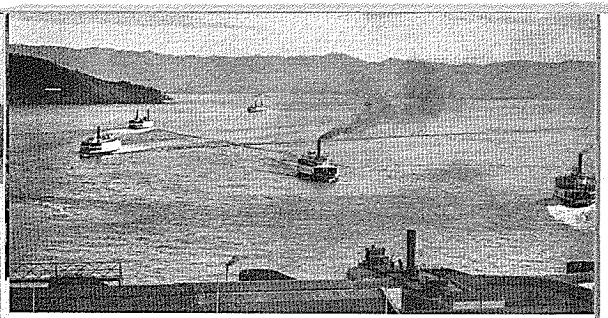
Ferry Boat Operations

SP's ferry boat operations in interurban service between San Francisco and cities on the east side of the bay, and in handling main line train passengers, dated from the late '60s. Local steam trains in Oakland, Berkeley and Alameda, that connected with ferry boats at Oakland and Alameda piers, were changed to electric in 1911-12-13. The electric lines operated as a single division during 1913-17, and then during 1922-30 as East Bay Electric Division. Ferry service for automobiles was inaugurated from Oakland Pier in April, 1923. During 1930 SP and its affiliated companies operated 43 ferry boats on San Francisco Bay, the largest transportation enterprise of its kind in the world. The SPGG auto ferries enjoyed their peak year in 1930, handling over 6,117,000 vehicles and nearly 15,000,000 passengers. That year the railroad's ferries and the SPGG auto ferries carried 40,211,535 passengers.

Patronage of both the passenger and auto ferries began to drop off when the two big bridges were opened to automobile traffic. Ferry boats in connection with interurban service to Oakland and Alameda piers made their last runs the night of January 14, 1939, and the next day trains of the Interurban Electric Ry. began operation across the San Francisco-Oakland bridge direct over their lines from cities in the East Bay area. The only passenger ferries remaining in service between San Francisco and Oakland Pier were the three operated in connection with main line steam trains. Ferry service to Alameda Pier was abandoned, and soon afterwards the facilities there were salvaged. Traffic on the bridge trains toppled as tolls for auto travel were gradually lowered. Early in 1940 Interurban Electric asked authority to discontinue service. This was granted later in the year, to become effective as soon as adequate substitute service was available to commut-

LONGEST AND HEAVIEST railroad bridge west of the Mississippi is SP's double-track Martinez-Benicia bridge across Suisun Bay, 35 miles from San Francisco, opened to traffic October 15, 1930. The streamliner "City of San Francisco" of '36 is shown on the bridge in this picture.





A "BRIDGE" OF FERRY BOATS operated by SP and its affiliated auto ferry company carried passengers and vehicles across San Francisco Bay before the famed San Francisco-Oakland and Golden Gate bridges opened in November, 1936, and May, 1937, respectively. The fleet of 43 vessels was the largest ferry boat operation in the world.

ers. Train routes were abandoned by successive stages starting early in '41, and by July 26 that year SP's East Bay electric interurban passenger service faded into history. Certain of the lines were retained for freight service. Auto ferry service to all points on San Francisco Bay ceased to exist on May 16, 1940. Passenger ferries continued to operate only for main line train connections, and Steamer Division consolidated with the Western on October 1, 1940. Northwestern Pacific, affected by Golden Gate Bridge competition, discontinued its ferry boat and electric train interurban service, the last unit ending operations on February 28, 1941.

(In 1954 the ferry "Sacramento" was retired from service. It was replaced by the ferry "San Leandro," a 225-foot vessel acquired from the Federal Maritime Administration in June, 1954. Only other ferries operated by the railroad in 1955 were the "Berkeley" and the "Eureka." Two of the ferries were kept in service to and from main line trains, and the third in standby service.)

Among the important rail line affiliated companies of Southern Pacific not already mentioned in detail are the wholly-owned Pacific Electric Railway Co. in southern California; and the Pacific Fruit Express Co., jointly owned with the Union Pacific.

Pacific Electric

The Pacific Electric was organized in 1901 by Henry E. Huntington, nephew of Collis P. Huntington. It was, at first, principally an interurban passenger service radiating from Los Angeles. Southern Pacific bought half ownership and in November, 1910, acquired full control.

The present Pacific Electric Railway Company was incorporated September 1, 1911, and into it were consolidated other electric railway properties Huntington had controlled in Los Angeles, San Bernardino, Riverside and Orange counties. With 1,164 miles of track in 1926, it was the world's most extensive electric interurban passenger system and a dominant factor in the pattern of population growth in southern California.

Beginning in the thirties, however, Pacific Electric found it necessary to adopt a program of gradual substitution of motor coaches for the rail passenger service. At the same time the rail routes became increasingly important for freight traffic to serve the area's fast industrial development.

Increasing competition from private automobiles, coupled with increasing operating costs, depressed the passenger service into a number of years of deficit operation. Effective October 1, 1953, the passenger service properties—by then predominantly motor coach—were sold to Metropolitan Coach Lines. Southern Pacific retained a 336-mile extensive freight system, which continues as a separately operated subsidiary of Southern Pacific to serve four southern California counties. The Pacific Electric freight system now is predominantly diesel powered.

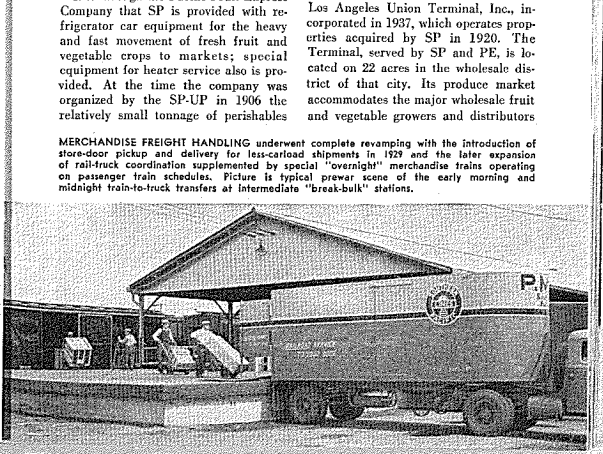
Pacific Fruit Express

It is through the Pacific Fruit Express Company that SP is provided with refrigerator car equipment for the heavy and fast movement of fresh fruit and vegetable crops to markets; special equipment for heater service also is provided. At the time the company was organized by the SP-UP in 1906 the relatively small tonnage of perishables moving to eastern markets was handled by a limited number of cars owned by private interests. PFE started its operations with 6,600 refrigerator cars. (By mid-1955 it had nearly 39,000 refrigerator cars in service. Included were 337 mechanically operated "supergiant" refrigerator cars designed to serve the frozen food industry. Starting in 1951 mechanical icing machines were being installed progressively at a number of major terminals.)

Cars of the Pacific Fruit Express operate over most railroad lines in the nation, also in Mexico and Canada. PFE icing plants, icing platforms and car shops are located in 15 states. At Roseville, Calif., it has the world's largest railroad car ice manufacturing plant. (More than 465,000 carloads of perishables were handled by PFE in the peak year of 1946. In 1954 the total was almost 400,000 cars.)

Also among the SP subsidiaries is the Los Angeles Union Terminal, Inc., incorporated in 1937, which operates properties acquired by SP in 1920. The Terminal, served by SP and PE, is located on 22 acres in the wholesale district of that city. Its produce market accommodates the major wholesale fruit and vegetable growers and distributors

MERCHANDISE FREIGHT HANDLING underwent complete revamping with the introduction of store-door pickup and delivery for less-carload shipments in 1929 and the later expansion of rail-truck coordination supplemented by special "overnight" merchandise trains operating on passenger train schedules. Picture is typical prewar scene of the early morning and midnight train-to-truck transfers at intermediate "break-bulk" stations.



serving the metropolitan area. In addition, there are warehouse buildings aggregating 2,000,000 square feet of floor space and accommodating a cold storage plant, food manufacturers and distributors, wholesale drug firms and department stores. The Union Terminal Warehouse, SP subsidiary, which occupies a large section of the rentable warehouse area, is the largest certified public warehouse in Los Angeles.

For a number of years SP subsidiaries operated local passenger electric lines in certain California cities. Interests in the Fresno Traction Co., Stockton Electric R.R. Co., San Jose Railroads, and San Jose & Santa Clara County R.R. Co. were disposed of on April 1, 1939. The Peninsular Railway, with about 65 miles of lines connecting San Jose with major communities of the Santa Clara Valley, operated until business decline in the early 1930's.

The SP still owns the Visalia Electric R.R. which operates freight service on 35 miles of lines serving Exeter, Woodlake, Redbanks, Lemon Cove and Fayette in Tulare County, but since 1944 its electric locomotives have been replaced by diesels.

Electric line operations from Portland to Corvallis, including the alternate route via Forest Grove, were discontinued in 1930, when the lines reverted to steam operation. Local streetcar lines in Albany (.87 mile) were abandoned in 1917; in Salem (11.7 miles) and Eugene (15 miles) in 1927; and in West Linn in 1930.

Buses and Trucks

Southern Pacific's activities in highway transportation have been with both buses and trucks.

The Southern Pacific Motor Transport Co. was organized in April, 1927, and began motor coach operations over interurban routes in Oregon. Interstate operations were established the next year, and several independent motor coach lines were purchased. On January 1, 1929, The Pacific Transportation Securities, Inc., was organized to consolidate SP's 4,442 miles of motor bus operations with Pickwick and Greyhound corporations west of Salt Lake City and El Paso and south of Portland. This organization took the name of Pacific Greyhound Corporation, April 1, 1930, and became Pacific Greyhound Lines in December, 1936. For a number of years Southern Pacific owned about one-third of the stock, giving up its voting rights in 1947 in a consent decree. SP completed the sale of its entire common stock on May 21, 1954, to the Greyhound Corporation, after receiving some preferred stock as a dividend.

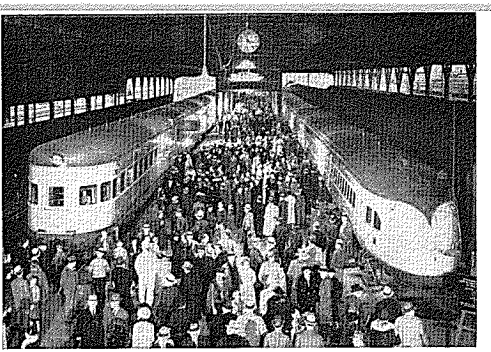
Southern Pacific also acquired, December 31, 1929, approximately a one-third interest in Southland Greyhound Lines, Inc., which operated bus service in Texas and Louisiana. In 1933 the company was reorganized and expanded as the Southwestern Greyhound Lines, Inc., SP retaining a smaller interest in the company.

It was on SP's electric line subsidiary between Los Angeles and some twenty stations in southern California that first test was given the revolutionary idea of providing local store-door pickup and delivery of less-than-carload merchandise freight as a means of meeting competition of highway truckers. The specially organized Pacific Electric Motor Transport Co. commenced operations March 11, 1929, with local trucking contracted to local draymen.

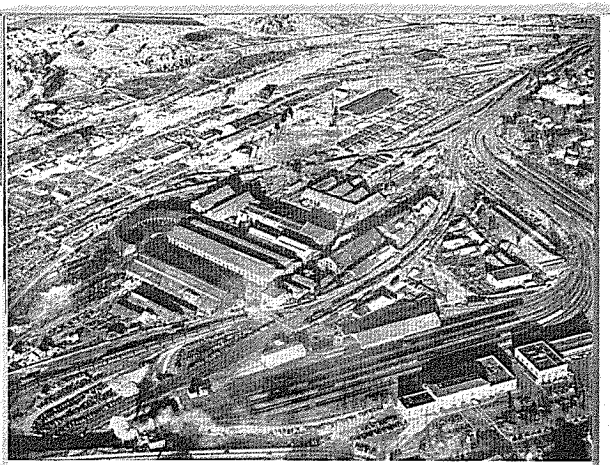
This service was so popular that it was expanded on the PE and to some points on SP lines. On February 4, 1930, the name was changed to Pacific Motor Transport Company. Operations were established out of San Francisco the following April and soon spread to many California and Oregon points.

First coordinated train-truck service was established in May, 1930, to give metropolitan distributing centers overnight delivery of merchandise freight to outlying territory. Freight was handled by train to central "set-out" points. It was distributed from there by PMT trucks to adjacent towns where the best available train service was too slow; or where small towns were too numerous to permit expedited trains to stop at

ACROSS THE MISSISSIPPI to and from New Orleans, SP trains began operation over impressive Huey Long Bridge in December, 1935, when this picture was taken. Ferrying of trains across the river ended and new Avondale terminal facilities replaced old Algiers yard.



"CITY OF SAN FRANCISCO" streamliners are shown at Oakland Pier terminal January 2, 1938, when the new ultra-modern 17-car train was inaugurated to supplant the original and smaller 11-car streamliner which had been in operation since June 14, 1936, between San Francisco and Chicago. Both trains carried capacity loads of holiday travelers.



SACRAMENTO SHOPS is largest railroad construction and repair plant west of Chicago. This picture, taken by Robert Handsaker of the Sacramento "Bee" in 1941, also shows the passenger station and train yard in lower right. First shops built in 1863, now expand over 200 acres, along with stores and roundhouse.

each station without impairing their fast schedules; or to reach areas contiguous to but not served by the railroad.

On SP's lines in Texas and Louisiana the same type of expedited merchandise freight service was performed by the railroad through the Southern Pacific Transport Company, which began operations in Texas on August 1, 1930, and Southern Pacific Transport Co. of Louisiana, Inc., which began operations in Louisiana on April 16, 1932.

Between San Francisco-Los Angeles, and other southern California points, a "direct delivery fast express service," linking passenger train operations with PMT to give merchandise freight overnight delivery, became effective in June, 1931. By 1932 this traffic had increased more than 43 per cent, and similar service was made available to most communities served by SP in California, Oregon, Arizona and Nevada.

PMT Organized

With this expansion of activity came the need for more highway operations and additional equipment. Pacific Motor Trucking Company was organized April 11, 1933, to own franchises and operate trucks in coordinated rail-truck service and, later, to take over from local draymen a major portion of the store-door pickup and delivery.

The Southern Pacific trucking and transport operations are now carried on by four subsidiaries: Pacific Motor Trucking Company and Pacific Motor Transport Company on Pacific Lines, and Southern Pacific Transport Company and Southern Pacific Transport Company of Louisiana on lines in Texas and Louisiana. On December 31, 1954, these subsidiaries had a total of 2,447 units of equipment. They operated over a total of 16,902 miles of truck routes.

(The St. Louis Southwestern also has important trucking operations which are carried on by its subsidiary, the Southwestern Transportation Company. At the end of 1954 SWT owned 462 units of equipment operating over 2,583 highway-route miles. It also had a small investment in the Southwestern Greyhound Lines, Inc., received in exchange for its passenger bus lines in 1933.)

Southern Pacific's coordinated rail-truck service represents a continuing development in the company's plan to give a complete land surface transportation service. It is proposed to expand the trucking services wherever that can be done advantageously.

The primary objective in expediting the handling of merchandise freight was not to substitute trucks for trains, but rather to supplement train operations with trucks and hold the long hauls to the rails. The development of the merchandise business through Southern Pacific's trucking services had the effect of adding more trains to the main line, more employes at freight stations, and more employment in other departments.

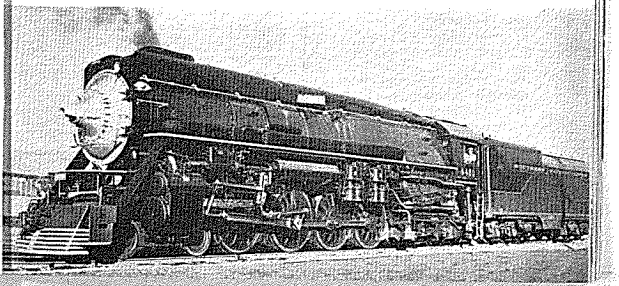
The Speedy "Overnights"

In the early 1930s miscellaneous mixed trains were introduced to give merchandise shipments the speed of passenger train deliveries. On August 5, 1935, came the first exclusively merchandise train, a solid freight operating on fast schedule; and on October 22, 1935, the "Overnight" made its debut in dusk-to-dawn operation over the 470-mile run between San Francisco and Los Angeles. This was the forerunner of similar speedy merchandise trains that were later to provide modernized overnight freight deliveries to practically all SP stations within trade areas of principal metropolitan distributing centers.

The mailing of waybills was too slow for these trains, so the waybills were teletyped to be in destination yard offices and stations ready for handling far in advance of arrival of the shipments, another practice in which SP was a pioneer.

Freight cars were especially built or equipped for the fast merchandise

NEW EQUIPMENT purchases from 1936 through August, 1945, were vital to SP's successful handling of unprecedented traffic. "General Service" 4-8-4s were among new locomotives.



trains, capable of standing up under sustained high speeds. "Break-bulk" points were established at strategically located stations, where contents of cars switched from the merchandise trains were speedily transferred to line-haul railroad trucks which in turn delivered shipments direct to customers at stations between "break-bulk" points.

In addition to their close coordination with the railroad's merchandise freight handling, the railroad's trucking operations were expanded in many instances to handle freight hauls of a carload nature from, or into, territory not reached by SP lines. Hauling of construction materials from rail points to project sites, and the hauling of pears out of Lake County, Calif., to nearest rail point, were typical of such traffic moved by PMT's trucks.

Truck Service Popular

This method of coordinated rail-truck freight handling gave major distributing centers such speedy and dependable deliveries to their jobbing and wholesale territory that traffic volume expanded rapidly. PMT acquired the Peoples Freight Line, Inc., April 1, 1939, and the Pacific Truck Express in July, 1940, adding materially to its trucking services in California, Oregon and Arizona. At end of 1939 SP's trucking subsidiaries were operating over 7,745 miles of highway routes.

Shortly after the Pearl Harbor attack which threw the United States into World War II, it was found necessary to make available for troop trains and war freights the locomotives and cars that had made famous the "Overnights" and other fast freight trains. However, the store-door pickup and delivery of less-than-carload shipments moving on regular freight trains continued to function, and the highway routes of the trucking subsidiaries were further expanded, serving military and naval establishments and wartime industries.

(After the war the "Overnights" returned, and in 1953 came the trailer-flat-car "piggyback" trains, a further refinement of coordinated train-truck service, to be described later.)

Travel Sales Tactics

Early in the 1930s, while business remained in a slump and traffic revenues continued on the downgrade, Southern Pacific sought to stimulate travel, both by improving equipment and service and by reducing fares.

Fares were reduced in some cases to a cent a mile, such as on "Dollar Days" when the railroad advertised "100 Miles of Travel for $1." Other low fares were made for Sunday excursions, such as the "Sun Tan Specials" between San Francisco and the Santa Cruz beach resort, and "Snowball Specials" to the Sierra.

A program of air-conditioning was inaugurated by putting such equipment in 14 dining cars in Sacramento shops in 1932. By 1936 Southern Pacific had the largest fleet of air-conditioned cars in the West and Southwest, on all principal trains. The work was done both at Sacramento and Houston shops, and also in conjunction with the Pullman Company. At the same time a large-scale program of modernization of passenger coaches was under way.

In 1936 came inauguration of a long series of passenger train improvements, as well as improvements in many phases of the railroad's operations. This resulted from a reassuring upturn in general business that made 1935 the best revenue year since 1931.

A new 11-car diesel-powered "City of San Francisco," first streamliner operated by SP, was put in service jointly with UP-C&NW June 14, 1936, on the Overland Route between San Francisco and Chicago, making five round trips a month on a 39¾-hour schedule. In that same year all of SP's popular pre-depression passenger trains were restored with faster schedules and improved equipment.

KEEPING TRACKS CLEAR over the Sierra and Cascades was a serious problem before introduction of the powerful rotary snowplow. In early days up to 4,000 men were used to hand-shovel snow and assist ram plows. This rotary was at work during heavy storm of 1938.

Greatest improvement was made in the "Daylight" on the 470-mile scenic Coast Line between San Francisco and Los Angeles. First run on April 28, 1922, as a Friday-Saturday special on a 13-hour schedule for summer months, this train captured popular fancy and was destined to become a travel institution. By April, 1924, it was established on a daily year-around 12-hour schedule, with special observation car and lunch car. For a time its exterior was painted silver gray, but the color proved impractical. It was one of the nation's most popular trains when the depression hit, but in 1932 was reduced to local train status.

The "Daylight" was first of SP's trains to be rejuvenated in 1936. It went on an 11-hour schedule February 16 and the following June announcement was made that streamlined cars and specially designed new streamlined steam locomotives had been ordered to make it one of the most sensational passenger trains of all time.

Two beautiful red-orange-black streamliners, each costing a million dollars, each with 449 saleable seats were placed in service March 21, 1937, on a 9¾-hour schedule. Less than five months later the 100,000th passenger had been carried to give the twin "Daylights" an American record for travel on a single section train. They continue in the front rank of the nation's most heavily traveled trains.

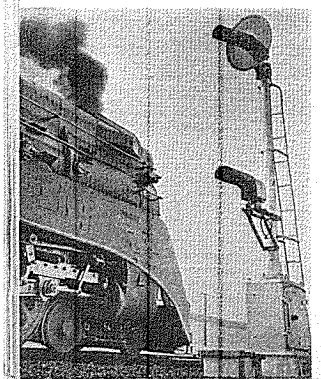
On September 19, 1937, the streamlined "Hustlers" and "Sunbeams" of design similar to the "Daylights" were placed in service between Houston and Dallas, Texas.

In addition to the spectacular streamliners other new trains and improved passenger services were added during 1937. Two so-called "economy trains" carrying modern coaches and tourist sleeping cars were introduced in transcontinental service with low fares, low-priced meals, separate cars for women and children. These were the "Californian," which began operation January 3 over the SP-Rock Island lines' Golden State Route between Los Angeles and Chicago; and the "San Francisco Challenger," September 15 over the SP-UP-C&NW lines on the Overland Route between San Francisco and Chicago.

The popular stewardess-nurse service, first introduced on the "City of San Francisco" for the particular accommodation of mothers traveling with children, became a feature of the two "economy" trains as well as on the "Overland." (The stewardess-nurse service continued until abandoned with other luxury services in wartime.)

Another new steam train, the 8-car all-Pullman "Forty-Niner" of streamline design, was added July 8, 1937, on a 49-hour schedule between San Francisco and Chicago, staggering its five round-trips a month with those of the "City of San Francisco" to provide streamliner service on the Overland Route every three days.

HOODED LIGHTS for signals, locomotives and trains had their American debut on Southern Pacific Lines. Permitting operations on main line and in terminal yards during blackouts that accompanied air raid alarms, they were in use in the Pacific Coast war zone area from shortly after the Pearl Harbor attack until early part of 1944.



Freight Service Speeded

Such were the highlights of passenger service improvements, but since freight traffic was then producing about 80 per cent of the Company's revenues this major phase of operations came in for full attention. Extensive expansions in handling merchandise freight through rail-truck coordination had been steadily effected, as already reviewed here. At the same time transcontinental and many other long haul freight deliveries were stepped up through a continuous program of freight schedule improvements that by 1937 had increased the average speed of freight trains 28 per cent in a ten-year period with many individual freight runs speeded 40 per cent to 75 per cent during the decade.

The upswing in traffic volume that began in 1935, and which continued through 1936 into 1937, took a down turn in the latter part of '37 due to a nation-wide recession in industrial and other business activities. The slump reached its lowest stage in the forepart of '38.

ARMED FORCES personnel on government order or as individual furloughees, comprised 65 per cent of SP's all-time high revenue passenger load during 1944.

Again the railroad took a hitch in its belt, effecting every economy possible that would not weaken operating efficiency or would not seriously interfere with the continuous program of service improvements that had become distinctive of Southern Pacific. Certain services that were unprofitable because of lack of patronage were either abandoned or curtailed and some passenger train schedules were revised. But at the same time improvements went forward and equipment was added to services for which there was public demand. A new 17-car "City of San Francisco," embodying many developments in car accommodations and more powerful diesel locomotives, supplanted the original 11-car streamliner on January 2, 1938.

The most devastating combination of snow, rain and wind storms in the Company's history harassed the California lines early in 1938. One continuous storm blanketed most of the northern and central portions of the state from January 27 to February 14, with nineteen days of rain, a duration record.

Storms Take Heavy Toll

Hardest hit in the early February storm was the Sacramento Division (including the present Shasta Division), with heavy snow in the mountain regions, floods and high waters in the valley lowlands, rock and dirt slides in Sacramento River Canyon, and severe wind damage to pole lines through the central sections of the state. Points on the Coast and Western Divisions also came in for lots of trouble. A snowfall of 343 inches, heaviest ever recorded any month at the Sierra summit, fell in a 14-day storm that extended also over Siskiyou and Cascade mountains. Norden 1937-38 total was 805 inches. Every piece of snow-fighting equipment available was in almost constant operation keeping lines open over a total of 312 miles on widely scattered districts. A gale of hurricane proportions swept in from the Pacific February 9, toppling pole lines and uprooting trees from the rain-sodden

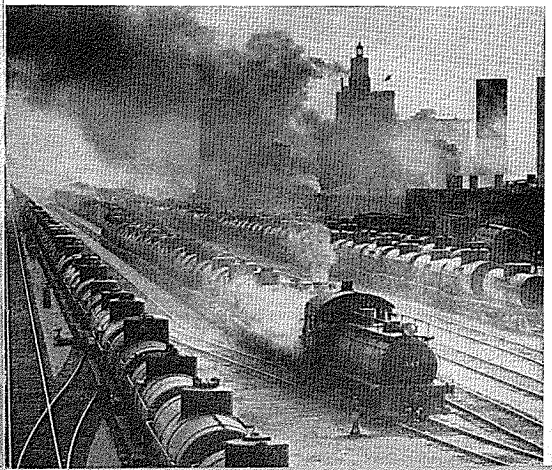
earth, demoralizing communications for hours and blocking the railroad at many places from San Luis Obispo to Gerber and east into the Sierra foothills. For the first time since the San Francisco fire and earthquake of 1906, SP's General Office was without wire contact with other system points for nearly eight hours. Damage to railroad telephone and telegraph service was the most severe in 35 years.

Hardly had the lines in northern California recovered from storm onslaughts than southern California was swept by the worst rains and floods in its history. This time it was the Los Angeles and San Joaquin divisions that faced the fury of the elements. Heavy rain started February 27 and by the morning of March 2 swollen streams began to take a toll in damage that increased as the storm reached its climax. The normally docile Santa Clara, Los Angeles, Santa Ana and San Gabriel rivers, and their tributary creeks, ran rampant. Los Angeles was isolated. All railroad and highway services were tied up. For most of two days there was virtually no communication by wire with the stricken district.

Focal points of most serious damage were: (1) Soledad Canyon, where the Santa Clara River tore into the railroad at many places along a 13-mile area, completely ripping out four miles of main line and five steel bridges, buried three bridges under sand and debris, and clogged two tunnels which had become huge culverts for the charging river; (2) Colton area, where the combined fury of the Santa Ana River and Lytle Creek made a shambles of the SP and PFE yards, covered tracks with silt up to a foot deep, and washed out 450 feet of track and wooden trestle approach to the Sunset Route main line bridge across the river; (3) Los Angeles, where the 301-foot double track Dayton Avenue bridge collapsed, severing rail connections to the north and where river embankments were washed from under main line and Taylor Yard trackage; (4) Montalvo bridge, where a struggle of two days and two nights saved the 35-span steel structure which was the key to reopening the Coast Line.

There was no letup in the day and night battle by the railroad's forces to complete emergency repairs, and early on the morning of March 5 Southern Pacific—over the Coast Line—was the first railroad to restore service into Los Angeles. Trains began operation over the transcontinental Sunset Route near midnight on March 7, but it was the morning of March 15 before the San Joaquin Valley line through Soledad Canyon was functioning. The cost of final repairs and protective improvements to the SP and Pacific Electric properties was about $2,323,000.

PETROLEUM SHIPMENTS, normally moved by ocean tankers, added to SP's World War II traffic load, particularly on lines in Texas and Louisiana. Picture is of yard at Beaumont, Tex.



TROOP SLEEPERS, troop kitchen cars, government owned, were only passenger cars built for rail use after war broke. Record passenger load was handled with fewer locomotives and cars than railroads had for World War I. This train is on SP line in the Sierra.

Headquarters Moved West

In a move toward greater efficiency, through bringing the top management more directly in touch with local problems, official headquarters of the Southern Pacific Company were moved July 13, 1939, from New York to San Francisco and the Board of Directors was reorganized with an all-western Executive Committee. This change was made coincident with the retirement of Hale Holden as chairman. The position of chairman was discontinued and the duties and authority of that office were transferred to President A. D. McDonald.

Construction was begun in September, 1938, by the Federal Government on the Shasta Dam, one of the major items in California's great Central Valley Water Project. Erection of the dam across SP's main line in the Sacramento River Canyon, 14 miles north of Redding, caused the abandonment of about 36 miles of mainline railroad and its relocation on a new 30-mile route between Redding and

Delta. Building of the new $15,000,000 main line got under way in October, 1938, and pending its completion a temporary track for SP's Shasta Route was laid through a diversion tunnel under the west abutment of the dam. The temporary route was opened for operation on June 26, 1939, and on May 24, 1942, all trains were operating over the new line, equipped with Centralized Traffic Control, with 12 tunnels totaling over three and a half miles in length, and featuring a 3,588-foot double-track two-deck rail-highway bridge across the Pit River. This bridge, one of eight on the new line, is 500 feet high and among the tallest railroad bridges in the world. Fourteen miles of old main line, between Redding and Coram, are now a branch.

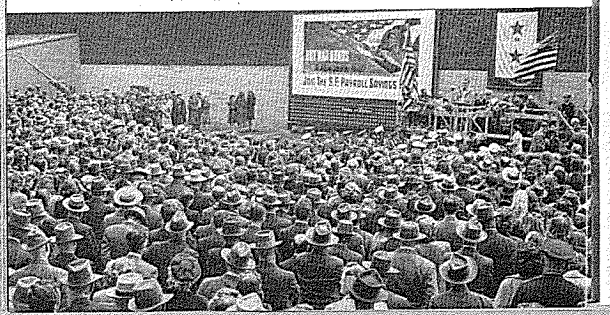
Considerable new passenger equipment was ordered and new services were inaugurated during 1939-41. Two 14-car "Noon Daylights" began operation March 30, 1940, between San Francisco and Los Angeles to provide two twin streamliners each way daily over the Coast Route. On June 8, 1940, the "Beaver" was established as an economy type train between San Francisco and Portland. The "Treasure Island Special," 9-car all-Pullman train, was operated during the summers of 1939-40 to provide streamliner passenger service every other day on the Overland Route in handling heavy tourist and vacation travel partly stimulated by the Golden Gate International Exposition held those two years on Treasure Island in San Francisco Bay. To accommodate winter vacation travel between Chicago, Tucson and Phoenix, the "Arizona Limiteds," two all-Pullman streamliners were operated jointly with Rock Island every other day from December 15, 1940, to April 1, 1941, and again during the 1941-42 season. Two "San Joaquin Daylights" were inaugurated July 4, 1941, on the San Joaquin Valley run between Oakland and Los Angeles, and late the same month a second 17-car "City of San Francisco" was placed in operation. Twin 17-car "Larks" between SF-LA became the nation's premier sleeping car trains July 10, 1941, with equipment that included a luxurious unique 3-unit lounge-diner-kitchen car. First of newest type Pullmans already had been added to the train in March.

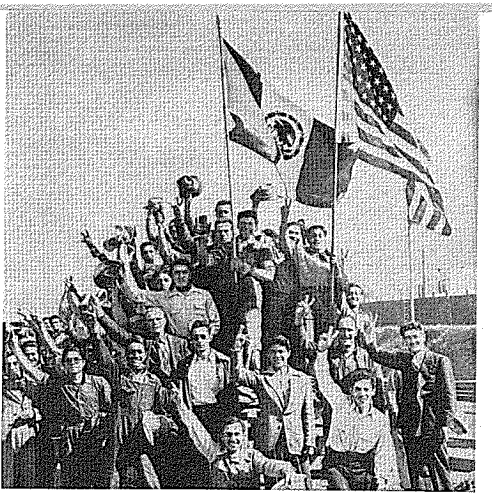
Meantime, the railroad's freight volume had become progressively heavier. An early 1939 upswing in traffic, coupled with the September outbreak of war in Europe, sent SP's net ton-miles of freight that year more than 12 percent above '38. Then in 1940-41 the government's defense preparations brought continually mounting volumes of traffic as the nation's industry amazed the world in establishing U. S. as the "arsenal of democracy" and Americans girded themselves for whatever eventuality the European war might bring.

Best measure of SP's intense activity during the period before the war was the increase in tons of revenue freight hauled one mile during 1940-41. Such traffic went to an all-time high in 1940, but that record was short-lived when the 1941 figure exceeded it by 39 per cent.

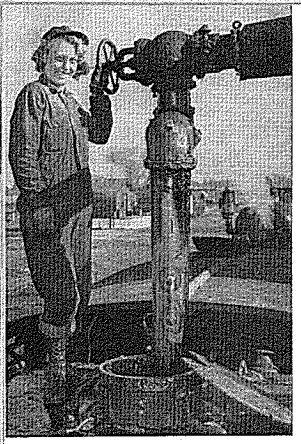
Foresight that had prompted in 1936 the start of a vast program of system-wide plant improvements was further evidenced through the defense period in readying SP's lines for the great test ahead. During the pre-war years 1936 through 1941, the Company spent approximately $123,000,000 for additions and betterments. The principal expenditures were for new equipment and during that period such authorization exceeded $88,000,000 for 14,582 units of equipment, including 156 steam locomotives, 73

ON THE HOME FRONT SP's men and women not only performed the greatest transportation job in the railroad's history to back up the fighting forces, but gave wholeheartedly of their blood, time and money in supporting the varied wartime civilian activities. This picture of employes assembled in the San Francisco General Office courtyard to honor the armed forces on "SP War Service Day" was typical of scenes elsewhere over the railroad.





MEXICAN NATIONALS were imported and other help came from whitecollar workers on weekends. In Arizona, Navajo and Hopi Indians took track jobs. Manpower shortage was one of biggest wartime problems; about 5,000 at war's end.



MANPOWER SHORTAGE was reduced when some 4,000 women like one above took over non-clerical jobs formerly done by men.

diesel switchers, 14,158 freight cars and cabooses (plus $11,500,000 as SP's share in 5,725 PFE refrigerator cars), 168 streamlined passenger cars, and two diesel passenger locomotives and 11 cars for the two "City of San Francisco" trains jointly owned with UP and C&NW.

Everywhere, and in every department of operations, the railroad was being geared for the emergency that was to prove the biggest it ever had to meet.

CHAPTER 6

War and Postwar 1941-1951

THREE weeks before the Pearl Harbor attack, December 7, 1941, that plunged America into the war, President A. D. McDonald of Southern Pacific unexpectedly died on November 15. He had successfully brought the railroad through the difficult years of the national depression and had toughened it for the task ahead.

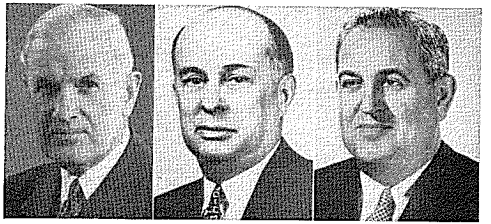
Four days after the Pearl Harbor attack, A. T. Mercier was elected to succeed President McDonald and to guide the railroad through its severest test—the handling of wartime record-smashing traffic loads. Southern Pacific was to be the major rail artery of supply for the war in the Pacific. Its men and women were to perform the greatest job in the railroad's history.

SP Lines Wartime Hub

On Southern Pacific Lines were located 290 military and naval establishments, more than on any other railroad in the country. On the West Coast were aircraft plants that built 60 per cent by weight of all the U. S. fighting planes manufactured during the war, and shipyards that built 44 per cent of the nation's new cargo tonnage. The Army's great Port of Embarkation on San Francisco Bay ranked first among the nation's war supply ports early and late in the war and was surpassed at other periods of the war only by New York. Also on San Francisco Bay the Navy had developed the world's largest naval supply base.

Prewar all-time annual freight traffic records on SP lines, as measured in revenue ton-miles, were surpassed for five years in succession during the defense and war periods, 1940-44 inclusive. In the wartime peak month of August 1944 freight traffic was more than twice the previous all-time peak in October 1929. When war ended in mid-August 1945 freight traffic was moving at a volume nearly three times that of 1939.

To get the fullest possible utilization of freight equipment, all railroads joined in a nationwide campaign sponsored by the 13 Shippers Advisory Boards and the Car Service Division of the Association of American Railroads. Shippers contributed importantly through heavier loading of cars, also by swifter loading and prompt unloading, making available the theoretical equivalent of many thousands of additional cars.



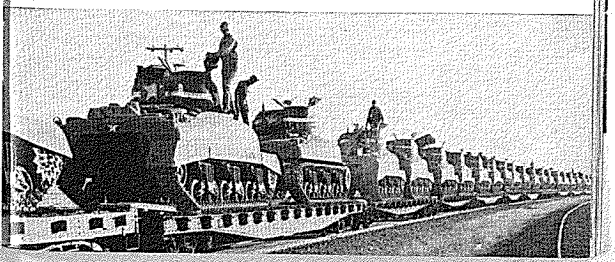
SP PRESIDENTS: During crucial years of the depression and national preparedness A. D. McDonald (left) headed the Company. His death on November 15, 1941, gave A. T. Mercier (center) heavy responsibility of directing wartime operations as Company's chief executive. Mercier retired December 31, 1951, and was succeeded by D. J. Russell (right), the Company's youngest president since Leland Stanford. Under President Russell, Southern Pacific transportation system continued its technological advancement and expanded its services.

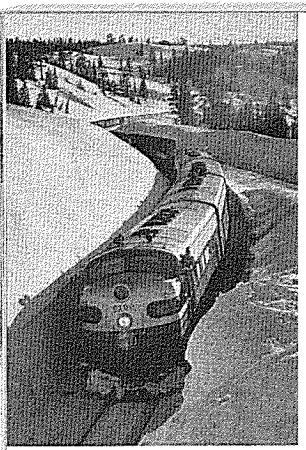
Southern Pacific handled an enormous volume of transcontinental traffic that ordinarily would have moved by steamship through the Panama Canal, had not intercoastal steamers been first diverted to foreign trade routes and then taken over by the Government. Last of SP's own ships operating between Gulf and Atlantic ports were acquired by the Government in March-July, 1941. Also, oil moved by rail in large quantities when coastwise ocean tankers were almost out of the picture.

How vital the railroads were to victory is shown by the fact they handled throughout the country during the war about 97 per cent of all organized troop movements and 90 per cent of all Army and Navy freight and express.

SP's passenger traffic in 1944 (the last

MATERIALS OF WAR streamed over SP lines in continuously mounting volume to soar freight traffic figures to new peaks for five years in succession during the defense and war periods. Heaviest month was August, 1944, when products of American factories were being speeded to the final victory offensives.





SNOW COUNTRY: SP's efficient snowfighters keep tracks open despite heavy storms in the Sierra or Cascades. This diesel freight navigates between walls of snow kept open during a near-record Sierra storm in 1952.

full war year) was about five times that of 1939 (the last year before national defense affected the volume of rail business), and nearly four times that of 1918, the peak year for World War I. About 65 per cent of the traffic volume in 1944 was military, a percentage that continued into 1945. The wartime peak of 959 special government passenger and mixed trains was reached during the V-J month of August, 1945.

The passenger load was handled in fewer cars than in World War I because no new passenger cars could be built for individual railroads during World War II because of Government restrictions on materials. Only additions to passenger equipment in the nation were 1,200 troop sleepers and 400 kitchen cars built for the Army.

To carry more passengers SP removed so-called luxury cars (lounge, club and tavern) from its trains. To discourage non-military travel practically all excursion fares were discontinued. Further drastic action was taken by discontinuing 31 passenger trains in 1942, some being among the Company's best paying trains. As early as January 5, 1942, the "Noon Daylight" and the San Francisco-Los Angeles portion of the "Sunset Limited's" run were removed.

Southern Pacific's dining car service operated at an all-time peak volume despite labor shortages. In 1944 SP served approximately 25,000,000 meals and other food items on its trains and in other food serving units, a volume never before approached by any other railroad. During the war it served to armed forces personnel more military meals in dining cars than any other two railroads in the country.

Improvements

The wartime additions to freight equipment of the Transportation System and Solely Controlled Affiliates were 64 steam locomotives, 64 diesel switchers and 950 freight cars costing a total of $23,000,000, plus 1,000 new PFE cars costing $5,000,000 ($2,500,000 being SP's share). In all, approximately $111,000,000 was spent for additions and betterments, including equipment, during 1942 through August, 1945. Government orders limited the amount of equipment the railroads could obtain in this period.

An extensive repair and reconditioning program in all the Company's shops kept bad-order cars at a minimum. Many old locomotives were called back into service, even some that had been in use as stationary steam plants.

Earnings were poured back into terminal yard and roundhouse expansions, main line siding extensions, new rail, Centralized Traffic Control, improved shop facilities and better communications. For example, prior to the war SP had only 39.7 miles of CTC. Total mileage under CTC at end of 1945 was 384, costing about $8,000,000, including incidental track changes.

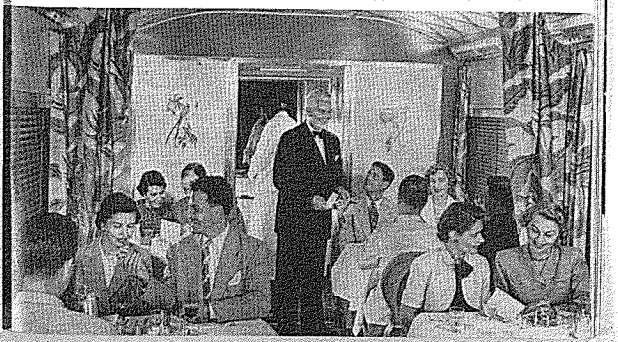
Centralized Traffic Control is a form of train dispatching through remote control over wayside signals and track switches, doing away with the need for written train orders. The dispatcher sits at a desk above which is a diagram of all track in his district. Lights on the diagram automatically show the locations of trains at all times, as well as the settings of the track switches. On a graph moving by clockwork across his desk, pens automatically record the progress of the trains. By moving small levers and pressing buttons to send out coded electrical impulses, the dispatcher can change the aspect of wayside signals and the settings of switches, unless the guardian block signal system automatically restricts him. Sometimes he can control trains so exactly that they meet and pass at sidings on single track without either train coming to a halt. This form of train dispatching has been found to increase the train carrying capacity of single track 50 to 75 per cent.

In the war years 1942-45 SP laid 1,900 miles of new rail, mostly 113 or 132-pound per yard to replace lighter rail. Nine tunnels were replaced by open cuts, or eliminated by line change. The spectacular 1,515-foot long, 326-foot high bridge across the Pecos River in West Texas was replaced in December, 1944, by a 1,390-foot long continuous cantilever type single track bridge capable of handling heavier loads. The railroad's transcontinental communications system, including 13,000 miles of pole line, acquired new equipment to handle a 45 per cent increase in telegrams.

Manpower Shortage

The manpower shortage was one of SP's greatest wartime problems. Some 20,000 employes of System Lines and Solely Controlled Affiliates entered the armed forces, many of them in the Railway Battalions. Some 4,000 women, nicknamed "railroadettes," took over non-clerical work formerly done exclusively by men in shops, stores, roundhouses and many operating jobs. Mexican nationals were imported to help. Enthusiastic non-railroad "white collar work-

DINING ABOARD: Striking reproductions of Louisiana's artist-naturalist John James Audubon were used to decorate the dining car on the new streamlined "Sunset Limited."



STEAM GIANT: The powerful cab-ahead steam locomotive, shown pulling a train of refrigerator cars along the California coast, supplied most of the heavy power until the coming of the more powerful and efficient diesel.

ers" even served for a time on track gangs. At end of 1944, approximately 113,000 persons were employed by the System companies and Solely Controlled Affiliates, many of them working overtime beyond their six-day week. Peak wartime month of employment on just the Pacific and T&NO lines was March, 1945, with a total of 96,619.

At war's beginning President Mercier said, "I know the men and women of our railroad. They have what it takes. Out on the line, in the yards, in the shops and offices, day and night they will continue to do the greatest job in our history." At war's end he said in part, "You have done a truly splendid job."

Southern Pacific workers did more than keep the Victory Trains rolling. They gave generously of their blood, time and money to the war effort at home, and with annual War Service Day observances they paid honor to former associates who had joined the armed services.

Had it been possible to visualize the war's gigantic tide of freight and passenger traffic before it became a reality, it is doubtful that successful handling of the transportation task would have been considered possible by SP from a standpoint of available equipment and facilities. That the job was accomplished is a tribute not only to the proficiency and determination of the railroad's men and women, but also to management's foresight and to the highly coordinated national program worked out by the various governmental agencies and the Association of American Railroads.

In World War I the railroads had been operated at a loss by the Federal Government in spite of raised freight rates. The loss had to be made up by the taxpayers. In World War II Southern Pacific was in charge of its own operations, moved record breaking traffic loads without serious congestions or car shortages, hauled heavy civilian business at the same time, made a profit and paid taxes into the Federal Treasury. And when war ended freight rates were no higher than when war began in Europe in 1939.

The job did not end with the surrender of the Japanese, August 14, 1945. Getting the military forces back home developed into the biggest haul many railroads had ever experienced. As 1945 drew to a close SP's passenger traffic was running about five times the prewar passenger-miles.

When the fighting forces were home again, Southern Pacific sadly but proudly placed 254 gold stars on its service flag for its own men who had given their lives to their country.

Postwar Recovery

In the immediate postwar period the railroad's physical properties—worn by the heavy traffic of five war years—needed replacement and modernization. And the rebuilding of the railroad was costly, because prices of materials had been inflated by the war, and materials were scarce. Also, railroaders faced by higher living costs, were granted higher wages.

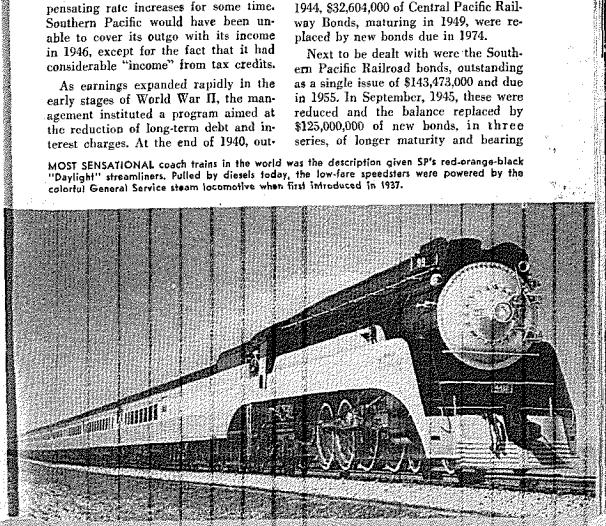
Railroad business in the postwar period did not get off to a good start, partly because conversion of industry to peacetime production proceeded in a less orderly manner than had been hoped for. Railroads were unable to get compensating rate increases for some time. Southern Pacific would have been unable to cover its outgo with its income in 1946, except for the fact that it had considerable "income" from tax credits.

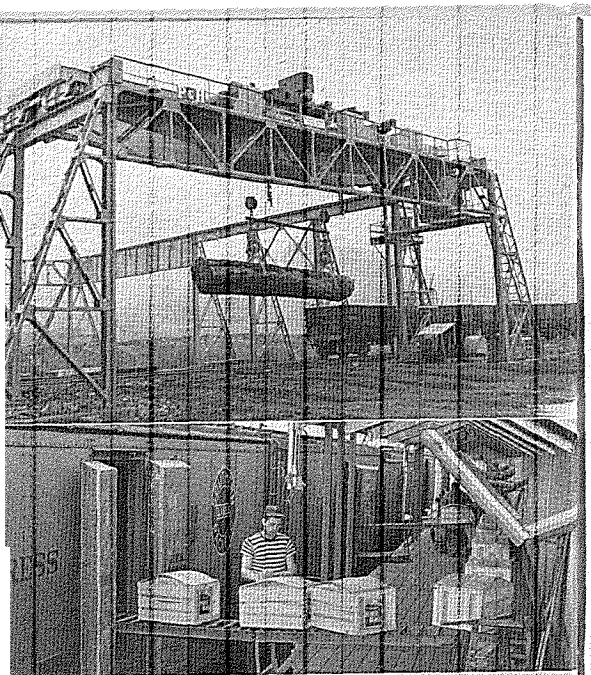
As earnings expanded rapidly in the early stages of World War II, the management instituted a program aimed at the reduction of long-term debt and interest charges. At the end of 1940, outstanding debt of Southern Pacific Transportation System and Solely Controlled Affiliates amounted to $758,228,000, consisting of $44,848,000 of equipment obligations and $713,380,000 of other debt, a substantial amount of which matured within a relatively short time.

During the four years beginning 1941, $189,323,000 principal amount of debt other than equipment obligations was retired, and by 1944 annual interest charges were cut to slightly less than $25,000,000, a reduction of a little more than $6,000,000 since 1940. During the same period, working capital was increased from approximately $40,000,000 to more than $85,000,000. The financial position was so strengthened that management could consider the extension of maturities, and in the latter part of 1944, $32,604,000 of Central Pacific Railway Bonds, maturing in 1949, were replaced by new bonds due in 1974.

Next to be dealt with were the Southern Pacific Railroad bonds, outstanding as a single issue of $143,473,000 and due in 1955. In September, 1945, these were reduced and the balance replaced by $125,000,000 of new bonds, in three series, of longer maturity and bearing

MOST SENSATIONAL coach trains in the world was the description given SP's red-orange-black "Daylight" streamliners. Pulled by diesels today, the low-fare speedsters were powered by the colorful General Service steam locomotive when first introduced in 1937.





lower interest rates. In early 1946, the new bonds were refunded by other bonds bearing still lower rates of interest. These transactions resulted in extending maturities and produced interest savings of $2,364,000 annually.

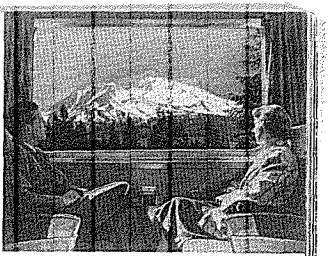
Other refundings were effected later in 1946, 1947, and 1948. When completed, interest charges had been further reduced and all bond issues maturing prior to 1961 had been eliminated except one small issue.

Financing activities after 1945 were dictated largely by the vast program of capital improvements necessitated by the growth in population and the expansion of industry in the West and Southwest. As the demands for capital exceeded the amounts available from operations, it was necessary to borrow new money to finance certain of the additions and betterments. These borrowings took the form of serial equipment obligations, bearing low rates of interest and maturing in annual installments, and a convertible debenture issue, practically all of which was later converted into common stock.

With equipment debt of $149,867,000 and other debt of $469,980,000 at the end of 1951, total debt was 18% less than at the end of 1940 and interest charges had been reduced by 34% to $20,442,000. There were 14 different bond issues as compared with 31.

Higher freight rates were authorized effective January 1, 1947, replacing small interim increases granted for last six months of 1946. Also, 1947 brought an upsurge in general business activity. Spectacular increase in population, and industrialization of the territory served by Southern Pacific, put a sound base under the new prosperity.

Two factors were important contributors to the population growth. First, the



SKY-VIEW WINDOWS introduced by SP on "Shasta Daylights" give the streamliner's passengers an unobstructed view of scenery.

West and Southwest apparently made a good impression on many thousands of the armed forces who passed through this territory or trained here, and they returned after the war to establish their homes. Second, the many who had been attracted here by defense industry jobs remained to seek employment in peacetime industries. Both groups advertised this area to their friends and relatives elsewhere. As a result, the population in the eight states served by SP gained 34 per cent between 1940 and 1950 while the other 40 states gained an average of only 11 per cent.

In the first three postwar years, new industries were established along Southern Pacific lines at the rate of more than two a day. In the 1950s, the rate of industrial location settled to the long-time average of one a day. In 1955 the railroad could report that for more than a quarter century there had been an average net gain of one new carload producing industry along its lines every calendar day.

Continuing to be a major carrier of perishables and timber products, Southern Pacific was moving a diversity of

ALL TYPES OF FREIGHT are handled by SP, including (opposite page, top to bottom) huge logs, perishable fruit and vegetables and baled cotton. Each of the commodities shown represents large percentage of shipments hauled by the Company.

freight that helped distribute the traffic load through all seasons.

New Freight Cars

In the years closely following the end of the war Southern Pacific placed thousands of new freight cars in service, but so many cars had been worn out in the wartime period that for a while it was impossible for builders to supply new cars fast enough to replace them.

This condition was general. Nationally, the freight car shortage was not eased until 1948. By that time the new cars in service, although still somewhat fewer in number than before the war, had a greater total carrying capacity because they were larger as well as better than the old cars they replaced.

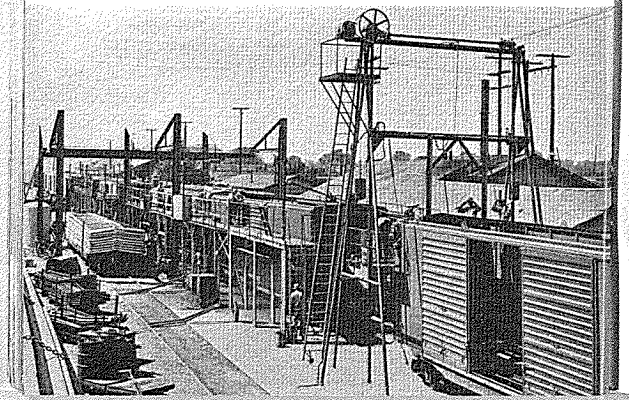
Nationally, the orders for new cars fell off sharply in 1949 as result of a traffic decline that temporarily left the railroads with a surplus of cars. The temporary nature of the decline was not evident, and most railroads slackened off their orders for new cars. Delivery of new cars continued on Southern Pacific, and over 6,000 cars were received in 1949.

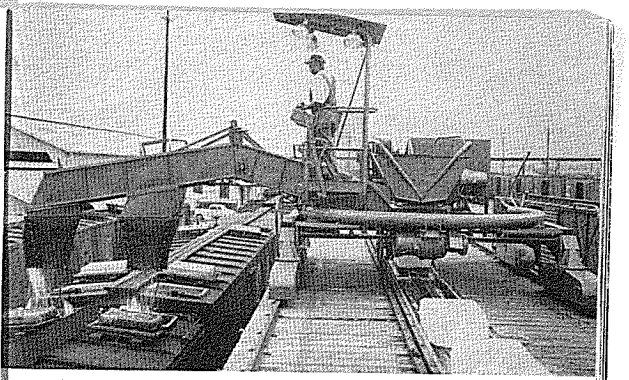
During the ten year period ending with 1950 Southern Pacific increased the carrying capacity of its freight car fleet by 33 per cent compared with the national gain of 6 per cent.

When the Korean crisis struck in the summer of 1950 Southern Pacific was comparatively well equipped with freight cars, but because of a national car shortage, still lacked enough to carry the load developed by the tremendous upsurge in business then and in succeeding months.

Never in SP history had business activity reached such high levels as in the closing months of 1950. Nationwide demand for freight cars, spurred by the rush of buyers to stock up on goods they feared soon would be scarce, was far in excess of available supply. The situation was acute on SP lines where the need for cars by the military was added to the peak car requirements for seasonal crop movements and the car demands of sawmills trying to meet record lumber demands. In an effort to alleviate the situation, SP was bringing empty cars all the way from Texas for lumber loadings in Oregon.

ASSEMBLY LINE METHODS were adopted to speed Southern Pacific's own freight car construction program. Here box cars are being put together at the Company's shops in Sacramento.





PERISHABLE SHIPMENTS in huge volume are handled over SP lines by the Pacific Fruit Express Company, organized by SP and UP in 1906. This machine, designed especially for PFE for loading ice into refrigerator cars, handles five tons of ice per minute.

SP's freight load in 1951 was nearly as large as its record volume at peak of the war traffic in 1944.

In carrying forward a vast improvement program, the System's capital expenditures approximated $374,500,000 for the six-year postwar period ending in 1951. Capacity and efficiency of the transportation plant had been substantially increased by progressive dieselization of motive power, lengthening of sidings, freight car additions, more Centralized Traffic Control, and freight yard improvements.

Important among these plant improvements were those made at Los Angeles and nearby points. A complete new Los Angeles diesel service and repair unit was ready for operation in 1949, together with an adjacent new Stores layout. On March 21 that year work got under way to improve and expand Taylor Unit of the Los Angeles Yard. Equipped with the first push-button car retarders installed on the West Coast, the highly modernized hump yard went into operation early in December, 1949. Its increased track capacity and facilities for much faster car handling were linked with new trackage in other recently improved nearby yards, including Colton. Cost of these new diesel and yard facilities was in excess of $5,600,000. Also in the southern California area, an installation of Centralized Traffic Control from Colton into Los Angeles was completed in September, 1949, to provide 123.7 miles of CTC all the way from Los Angeles to Indio.

Production of new passenger cars

was seriously delayed after the war, due to need to build freight cars first. The first of the slowly arriving new passenger cars were inserted in SP's portion of the equipment of the "Golden State," which had been placed on an approximately 48-hour schedule between Los Angeles and Chicago in June, 1946, fastest regular-fare schedule in the history of the Golden State Route. By the end of 1947 this train was practically a full streamliner, and on January 4, 1948, it was speeded to about 45 hours running time as an extra-fare diesel-powered train.

As an example of how difficult it was to obtain delivery of new passenger cars after the war, Southern Pacific's orders for new "Shasta Daylight" cars can be cited. The orders were placed early in 1946 for the new streamlined equipment the railroad hoped to receive in the following year. The builders set the delivery dates back until the new cars barely arrived in time to inaugurate the "Shasta Daylight" July 10, 1949, on a record-breaking 15½ hours schedule for the 718-mile daily run between San Francisco and Portland.

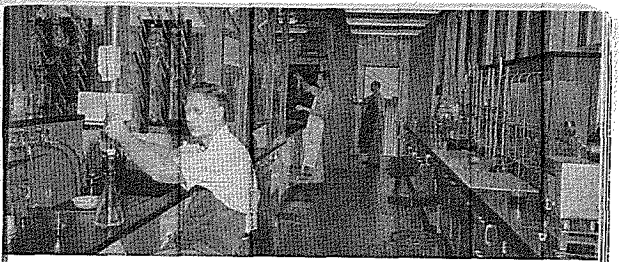
The "Cascade" night train was streamlined and placed on a new schedule August 13, 1950, clipping two hours off the best previous sleeping car train schedule on the Shasta Route. It included a triple-unit "Cascade Club" that featured a 130-foot room for dining and lounging. One week later, August 20, on the Sunset Route between Los Angeles and New Orleans, the newly streamlined "Sunset Limited" went on a 42-hour schedule that cut five hours off the previous eastbound time and 3½ hours off the previous westbound time of the famous steam-powered train of the same name.

All these new trains, nine sets of equipment in all, were diesel powered.

The railroad in 1949 and 1950 put more new streamlined passenger trains into service than in any other comparable period in its history. In the latter year 119 streamlined cars were added, not only for the new streamliners but also for other trains.

The stock of The Pullman Company was purchased from Pullman, Inc., January 1, 1946, by a group of railroads made up of nearly all those operating sleeping car service. Each railroad also purchased from The Pullman Company the sleeping cars used in its own trains. SP purchased 59 lightweight cars from Pullman in 1946, and 170 conventional sleeping cars in 1948. Since then additional lightweight cars have been purchased and SP's present (mid-1955) sleeping car fleet consists of 290 cars, of which 129 are lightweight. All these cars are leased to The Pullman Company, which operates SP's sleeping car service.

DOUBLE-HEADER: As part of the Company's plan to offer complete land transportation service, SP's combined rail-truck operations have been expanded and new equipment added to the fleets of its trucking subsidiaries. The cab-over-engine diesel tractor and the 24-foot semitrailers shown below are used in "line haul" service between cities.



FOR RESEARCH: Modern laboratory facilities at Sacramento, Calif., became the center for chemical and physical analyses for the new research department created in March, 1955, to coordinate all SP research activities.

Among legislation favorable to the railroads in the postwar period was the bill which repealed the Land Grant rates. It became effective October 1, 1946, after which the Federal government could no longer require special low rates on its military freight and passenger traffic. These low rates already had repaid to the government, several times over, the original value of lands "granted" to the railroads in their pioneering years.

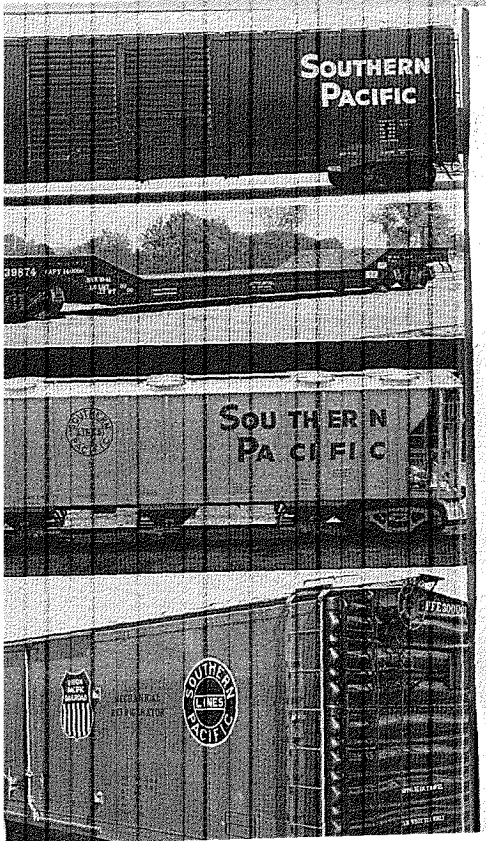
Incorporated in Delaware

Unfavorable was the tax suit filed against Southern Pacific by the State of Kentucky, in which state the railroad was incorporated in 1884. Kentucky asserted the right to an annual personal property tax on all stocks and bonds owned by the Company, beginning with the 1944 assessment, on the claim that these should be classed as "non-operating intangibles." Southern Pacific settled by paying more than $4,000,000 covering all years involved. On September 30, 1947, it transferred all its assets to a new corporation of the same name in Delaware.

Public and Employe Relations

At the close of World War II, Southern Pacific took an important and, organization-wise, novel step to make responsibility for good public relations, good service to patrons, and high employe morale a Company-wide endeavor. This was by appointment of a permanent Committee on Public and Employe Relations, comprising six principal department heads and reporting directly to the President. Chairman of the Committee is the officer who heads the Public Relations Department.

Among the first acts of this committee was to recommend establishment of a human relations conference training program for all officers, supervisors and employes whose duties brought them into direct contact with shippers and passengers. This training program, carried on by human relations specialists with groups of 20 people at all principal points on the railroad, has at-



tracted nationwide attention since its inception.

Also launched by the Public and Employe Relations Committee was production of a series of motion pictures to keep employes better informed about their railroad. First of these films, "This Is My Railroad," won national honors among industrial pictures, and has since been remade to bring it up-to-date with latest technological developments. Additional films have since been issued covering snow fighting in the Sierra, restoration of the line over the Tehachapi Mountains after the 1952 earthquake, and other subjects of current interest to employes and the general public. Many public groups make use of these films, as well as those produced by the Operating Department dealing with safety education and other subjects.

The Committee also concerns itself with all matters involving public relations policy and procedure, including local community relations.

End of 1951 marked another milepost in the history of Southern Pacific. On December 31 of that year the 10-year presidency of A. T. Mercier closed with his retirement. His railroad career had spanned 48 years—all with Southern Pacific—during which he held positions of major responsibility when the railroad met numerous emergency situations, and at the start of which he participated as a young engineer in the railroad's spectacular achievement of harnessing the Colorado River to save the Imperial Valley.

MANY TYPES of cars are required to meet shipper requirements, a few shown on opposite page. Top to bottom: A 50-foot, double-door box car of type much in demand by modern industry, more than 6,000 of which were built or ordered for SP service during ten years 1946-55 in a continuing program to meet postwar needs. A depressed-center flat-car for heavy and high loads. A 70-ton covered hopper car for bulk commodities. A super-giant mechanical refrigerator car especially designed to serve the growing frozen food industry.

CHAPTER 7

The Modern Southern Pacific

On January 1, 1952, Donald J. Russell, who had been executive vice president, became president of Southern Pacific Company at the age of 51—youngest president since the days of Leland Stanford.

As in the case of Mercier, and practically all other top officers of Southern Pacific, Russell had spent all his working years with the railroad, starting in 1920 after completing his engineering education at Stanford University.

He had been President Mercier's right hand man during the war. In carrying out the railroad's vast postwar improvement program, he saw the need for adapting newest discoveries in the sciences for improvement of railroading, and for further research. "We live in a new era of research," he said. "I would like every railroader to be proud of what has been accomplished, but at the same time not be satisfied."

Before he had time really to get settled into the presidency, Russell was confronted with two great operational emergencies. In his first month as president one of the most violent storms in the history of the Sierra Nevada mountains trapped the streamliner "City of San Francisco" January 12 in the snow for six days before it could be released. Passengers were in the train for three days, but no one was injured.

Then on July 21 the worst earthquake in California since the San Francisco quake of 1906 hit the railroad in the Tehachapi Mountains. The damage most difficult to repair occurred in four tunnels with total length of 2565 feet. Two of the tunnels had to be completely "daylighted" as open cuts, and another tunnel partially "daylighted." Huge machines moved approximately 300,000 cubic yards of earth to bridge a ravine with a fill on which a temporary shoo-

fly track was laid to reopen the line around the longest of the damaged tunnels just 25 days after the quake occurred. In addition, approximately 800,000 cubic yards of earth were moved in "daylighting" damaged tunnels and completing the grading work.

Freight Yard Projects

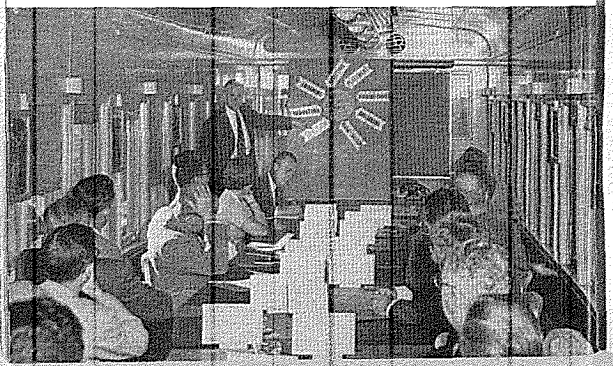
While these emergencies were met, substantial progress was being made on the systemwide program of yard improvements to expedite freight handling at key terminals.

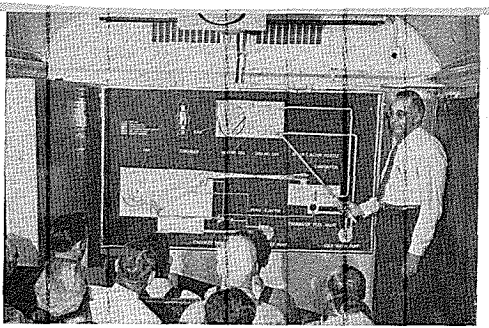
Biggest yard project then under way was the one at Roseville, started in April, 1951. Already the largest railroad yard on the Pacific Coast, this terminal in central California was to receive 49 miles of additional track to give it a total of 125 miles, including the icing platform trackage devoted to Pacific Fruit Express operations, with capacity for 8110 cars. Major phase of construction was conversion of the yard from a flat to a gravity switching operation. The entire rebuilt yard was placed in full operation in December, 1952, completely equipped as a most modern type pushbutton-controlled hump yard, capable of handling 4800 cars in and out daily. Its formal dedication had been on June 2, 1952, when the classification unit was put in service. At that time it was named "Jennings Yard," honoring Division Superintendent M. L. Jennings, who started railroading there as a switchman in 1906 and who retired in 1954. The cost of modernizing this yard was about $4,500,000.

At Ogden the SP and UP made extensive yard improvements in the jointly owned terminal operated by the Ogden Union Railway and Depot Company. Also the jointly-owned PFE expanded its facilities there for icing cars. Construction on the combined projects got under way in July, 1953. The 22 miles of new trackage and the modernized yard facilities were in complete operation by September, 1954, at a cost of approximately $4,000,000.

The Alfalfa unit of the El Paso Yard was increased by 13 tracks, a project that was completed in June, 1954.

CAMPUS-ON-RAILS: This specially-equipped railroad car, designed by SP to carry training programs throughout its lines, went into operation at Dunsmuir, Calif., November 3, 1954, on a continuing program of conferences dealing with latest techniques in interviewing, selecting and inducting new employes.





SCHOOL CAR: Special instruction cars have proved valuable in training SP personnel for many phases of railroading. This car was used for instruction in lubrication and air conditioning.

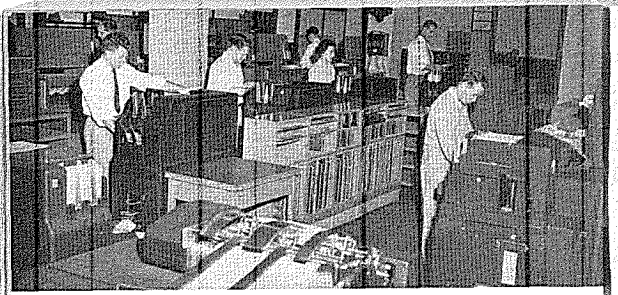
Construction was started in October, 1953, on enlarging the Englewood Yard at Houston, a $7,000,000 project that was to make this yard one of the most highly modernized in the nation, with radar and an "electric brain" practically replacing pushbuttons in switching freight cars. First units of the yard were placed in operation December 20, 1954. The four-mile-long yard, with 109 miles of track, was to be opened for complete operation in September, 1955, with capacity for 6605 cars and capable of handling up to 4200 cars in and out during a 24-hour period.

During the course of these major yard construction projects, operations at many yards over the system were being improved by Yardmaster Control Towers. These elevated, glass enclosed towers were strategically erected to give a yardmaster clear view of the yard, and to provide him with communication facilities, principally talkback loud speakers, for use in quickly directing the yardmen in car switching operations. First of these towers went into service at West Oakland Yard July 31, 1951.

Linked to improvements in yard terminal handling of freight cars were reductions in some freight train schedules. In July, 1953, SP and most of the lines comprising through routes between California and Chicago, St. Louis and New Orleans announced that experimental schedules cutting 24 hours off eastbound trains of perishables were being placed on a permanent basis. Additional reductions were made in freight schedules between Los Angeles-San Francisco-Oakland and Portland, one example being the "North Coast Perishable" schedule from Los Angeles to Portland which was reduced from 78 to 58½ hours in April, 1954.

Of the more than 41,000 new freight cars placed in service during the postwar years there were many of special types, such as covered hopper cars used for granular products like cement, soda ash, industrial sand; and wide-door 50 foot box cars for the lumber industry.

A program of constructing certain types of freight cars at Sacramento Shops was inaugurated in August, 1950. By October, 1954, the 10,000th car rolled off the assembly line, and the work con-



BUSINESS MACHINES have become increasingly important in SP's accounting procedures during post-war years. Use of punched card methods, started in 1912 (SP was first western railroad to adopt this method) has been extended to all major accounting and clerical functions, freight and passenger accounting, payroll and timekeeping, car accounting and reporting, statistics and many other functions.

tinued. Building of wide-door 50-foot box cars was a major job at these shops where in mid-1955, construction was at a pace of twelve cars a day.

Improved Freight Handling

A new department—Freight Protection, Merchandise and Station Service—was established in April, 1948, as a unit of the Operating Department. Its objective has been to effect general improvement in handling freight shipments—to give those shipments greater protection and to increase station and yard office efficiencies.

Working cooperatively with shippers and freight receivers, also with rail industry groups, many new techniques have been put into effect to improve packaging, loading, refrigeration and ventilation. Over 200 impact registers, mechanisms installed in freight cars to record coupling speeds, are used both locally and in transcontinental shipments to make recordings that are useful in correcting faulty car handling and to test various loading methods. Other such studies are made through use of a novel transparent plexiglass "telavue" car, designed and built at Sacramento Shops for first use in early 1955.

Among improved yard staff techniques were the first use in 1950 of "walkie-talkie" (radio pack sets) in car reporting, also the use of pneumatic tubes for transmitting messages and train consists. Expansive installations of various types of office business machines and modernized communications facilities were made in on-line operating offices.

This new department participates in many of the research projects that will be described later. Also it has major responsibilities in connection with efficient functioning of the Company's merchandise freight services and the newly inaugurated trailer-flatcar "piggyback" operations.

Freight by "Piggyback"

This new type of freight service to meet highway trucking competition was started in May, 1953, by the railroad on both its T&NO and Pacific Lines. At first confined mostly to the speedy "Overnights," it was later extended to other expedited trains such as the "Pacific Coast Expediter" inaugurated January 31, 1955, between the San Francisco Bay area and Pacific Northwest.

In this service only the trailer vans of the railroad's own highway trucking subsidiaries were handled.

Initially this trailer-flatcar service was established between Houston and Lake Charles, La., also between Los Angeles and Phoenix for less-than-carload shipments; and between San Francisco Bay Area and Los Angeles for less-than-carload merchandise and carlot shipments of certain commodities. The volume of this traffic increased rapidly in 1954 and 1955, expanding to other points in Louisiana, Texas, Arizona, Nevada, Oregon, Washington, Utah, Wyoming and Idaho—in some cases through interchange of trailers with connecting lines. By mid 1955 the volume of loaded trailers handled in an average day exceeded 200.

Research Activities

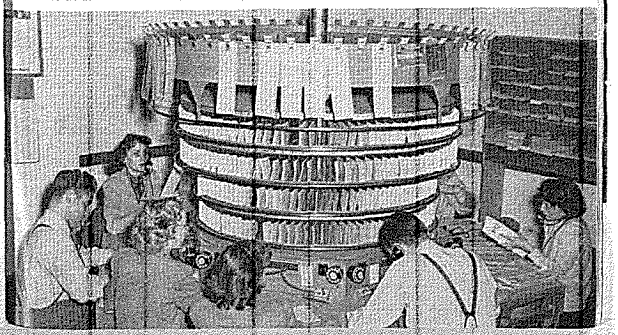
Southern Pacific's motive power department did considerable research in perfecting the tie-down devices for the flatcars in trailer-flatcar service.

Another research project on rolling stock was the development of a so-called cushion coupler in cooperation with Stanford Research Institute. After considerable experimentation with a pilot model, a full-size model was built into a box car completed at Sacramento Shops early in 1955 and placed in regular service to observe its performance under all kinds of operating conditions.

In the cushion coupler car the couplers were attached to a car-length sill which "floated" inside the car underframe. The sill's movement in relation to the car body was controlled by a hydraulic-friction braking mechanism which was tightened automatically in proportion to the force of the impact on either coupler. Early testing of the cushion-coupled car indicated that it could be coupled with other cars up to 10 mph., and the impact on the lading would be no more severe than at a speed of 4 mph. in a conventional box car.

A particularly puzzling problem was that concerned with mysterious fires in

IMPROVED METHODS of handling reservations for chair and sleeping car space after World War II included this four-unit reservation wheel developed by Southern Pacific. This reservation facility, put into operation at San Francisco, handles more than 3,000 units of space a day for 10 trains as far as a month in advance.



cotton shipments and in 1954-55 the railroad was engaged, with the help of Stanford Research Institute, in a study to develop the causes of these fires and formulate prevention measures.

An important equipment improvement was Southern Pacific's design and development of a new side and underframe construction for box cars, an innovation in freight car design. Basically this incorporated a new design for side sill construction, and a solid unit door frame which completely encompassed the door opening. The new design, in addition to strengthening a car, held the doors more securely.

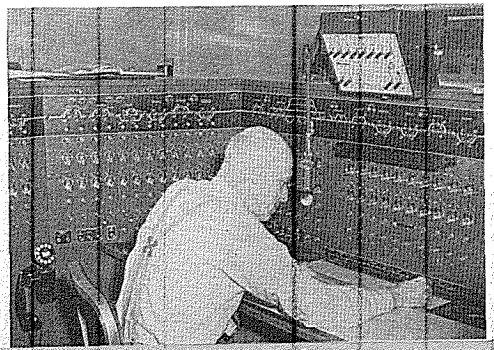
Another research project involved many months of experiments to determine more efficient methods of sanding rails under diesel locomotives, and resulted in developing a method which showed promise of saving millions of dollars a year for the nation's railroads through cutting down on the amount of sand used—thus greatly reducing the problem of keeping track ballast clean.

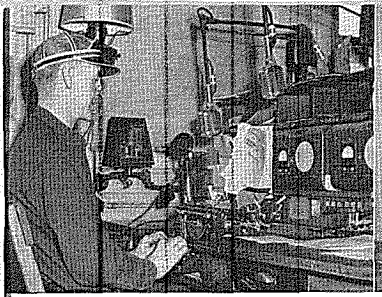
SP's new research department was created in March, 1955, to coordinate all research activities of the railroad. It maintains headquarters in San Francisco and field laboratories at Sacramento, Roseville, Ogden, Los Angeles and El Paso.

Existing laboratory facilities at Sacramento were modernized so they could serve more efficiently as the center for chemical and physical analyses, as well as for material inspections and testings. The Sacramento laboratory acquired in 1955 the latest design Ultrasonic Reflectoscope, providing access to the newest techniques in quality control of new wheels and axles for diesel locomotives and for other special tests involving the interior structure of metals. For detecting possible sub-surface flaws, a number of other advanced methods were in use, including gamma ray radiography at Sacramento laboratory, involving use of cobalt 60, a product of the Atomic Energy Commission.

The laboratories at other points on the railroad were concerned mostly with the testing of diesel locomotive parts,

CLEAR TRACK: Train operations were speeded and track capacity was increased with installation of Centralized Traffic Control in strategic single track areas. Through electrical remote control, the dispatcher can operate signals and switches in some cases as far as 200 miles away.





NEW ADVANCE: First experiments with use of train-radio operations on SP began in 1929, and by the early 1950's radio became commonplace. It became part of the communications system for train operation (left) and was adapted for many other railroad tasks, including that of car checking and inspecting (right).

fuels and lubricants, keeping the costly diesels moving with great dependability. Laboratory analysis of oil and water disclosed how engines were functioning and wearing, and indicated when overhauls should be made in order to avoid a breakdown in service.

A process for reclaiming journal box oil was worked out at the laboratories, and reclamation of various other oils was carefully controlled by tests.

Dieselization

Dieselization, of course, was the revolutionary improvement that brought greatest changes in SP's operations, as it did throughout the railroad industry. New efficiencies were effected, new facilities built, and many new ways of railroading instituted everywhere. SP's program of dieselization was under way before World War II, first with diesel switchers. In succeeding years various types of diesel power progressively took over operations as rapidly as it was considered the diminishing number of steam locomotives should be displaced. By mid 1955 SP had more than 1,660 diesel units in service, representing an expenditure of approximately $250,000,000. Diesel locomotives powered 86 per cent of the passenger train miles and 91 per cent of the freight volume in the first quarter of 1955. Complete dieselization was expected by the end of 1958.

Even on SP's 71-mile narrow gauge branch line between Keeler and Laws in southeastern California, one of the nation's few remaining "Slim Princess" operations, a diesel replaced steam on October 16, 1954.

Because of the flexibility of its electric drive a diesel locomotive can start a heavier train from a standstill more quickly than can a steam locomotive of the same horsepower rating, and the diesel can exert more pull at slow train speeds—such as up mountain grades—within the ratings of its traction motors.

On downgrades the electric motors of most diesel locomotives serve as electric brakes, saving wear on brake shoes and car wheels and often eliminating stops to set up or turn down brake retainers or to equalize braking heat in wheels.

Diesel locomotives are instantly available at any time of the day or night. Between jobs they burn little or no fuel. They spend less time out of service for

PUSHBUTTON RAILROADING became a reality with the introduction of switch control panels at classification yards at Houston, Los Angeles and Roseville.

shopping and repair than do steam locomotives, and on the road they can travel much longer distances without stopping for fuel and water.

Radio-Radar-Television

Experiments in television were launched in 1954, first of their kind on any railroad, to determine how well the activities of a large railroad yard could be viewed through television cameras, day and night, rather than from towers. The cameras, under remote control, were mounted on high poles, with television screens in ground floor offices.

Back in 1949 SP introduced a radar type fault finder, the first used by a railroad. It was installed at Dunsmuir to locate—sometimes within one pole length—trouble in telephone and telegraph lines miles away. It proved a time-saving device because trouble shooters could be dispatched directly to the trouble point. Later, similar installations were made elsewhere.

Southern Pacific, which pioneered use of telephones in the Sierra in 1878, and which began experiments with use of radio in train operations in 1939, became one of the first railroad users of the mobile radiotelephone service in December, 1946. At that time it equipped diesel switchers in the San Francisco yard area with this service, enabling terminal supervisors to communicate with yard engines. Later the Company installed its own radio equipment in switch engines and yard offices on many parts of the railroad. First regular train radio installations were made in August, 1950, in connection with diesel operations between Los Angeles and Bakersfield.

Extensive tests of radio as an auxiliary communication system for train dispatchers were conducted, and as the various obstacles were overcome installations were made. Commercial radio telephones for use by passengers were installed September 19, 1949, on the "Lark" and later on "Cascade" streamliners.

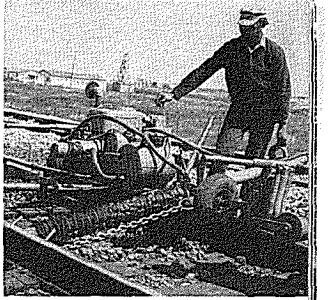
In the early 1950s radio was becoming commonplace on the railroad, not only between head and rear ends of trains and between stations and trains, but also on snow fighting equipment, in company automobiles, and by 1955 in the form of walkie-talkies carried by car checkers and car inspectors in the yards. In 1954 radio appeared on a track car and first uses were made of radio by flagmen and maintenance of way crews to reduce the possibility of delays to trains in areas where track work was under way.

Radio installations in the railroad's general office in San Francisco demonstrated in 1954 the practicability of communicating from there direct to trains almost anywhere on the railroad system in cases of emergency.

A project to install microwave to replace wires in a rugged portion of the Sacramento River canyon, where winter storms have sometimes interfered with wire lines, was launched in 1955. Microwave is a type of directional, line-of-sight ultra high frequency radio, and is usually transmitted between towers.

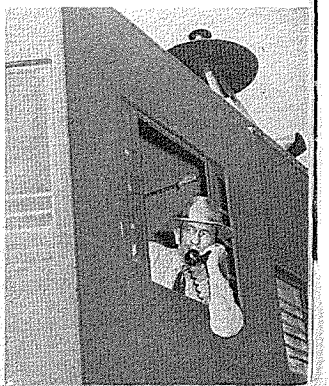
So swift has been the progress of science in communications that Southern Pacific in 1955 was using fewer wire circuits than ten years ago, although the number of its communications had multiplied. The railroad had increased the capacity of much of its 47,000 miles of wires by superimposing on them some 70,000 miles of electronic "carrier" circuits—a kind of wired radio. Sixteen persons can talk at one time over a pair of wires on which carrier circuits are superimposed.

Because teletypewriter circuits are simpler than voices, 18 times as many of these circuits could replace each voice, or a total of 288 such circuits at once on a pair of wires. Each tele-



NEW MACHINES like this tie-remover have been added by Southern Pacific to help its maintenance-of-way forces do a better job in keeping roadway in top operating condition. Other modern MofW tools include ballast tampers, powered spike hammers, tie-smoothing or adzing machines and track laying devices.

RADIO TELEPHONE equipment installed on Southern Pacific freight trains permits radio contact between head and rear ends of trains. Moving trains can communicate with numerous wayside stations and with other radio equipped trains.



typewriter circuit can control electric or electronic machines that reproduce teletypewriter tape for regular telegraphic purposes or for automatic business machine card records at stations hundreds of miles away.

The railroad was considering in 1955 the application of a fully automatic teletypewriter relay system. Code letters placed at the top of the original tape will enable the messages to find their way automatically to final destination, along the best available routes, or will serve as "memories" to hold the tape for transmission as soon as a circuit becomes available.

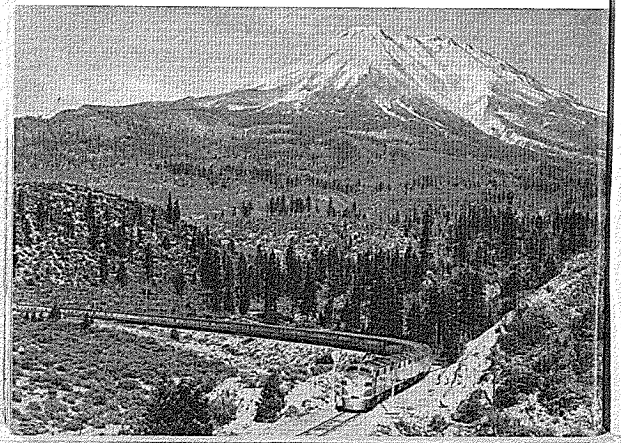
Automatic Business Machines

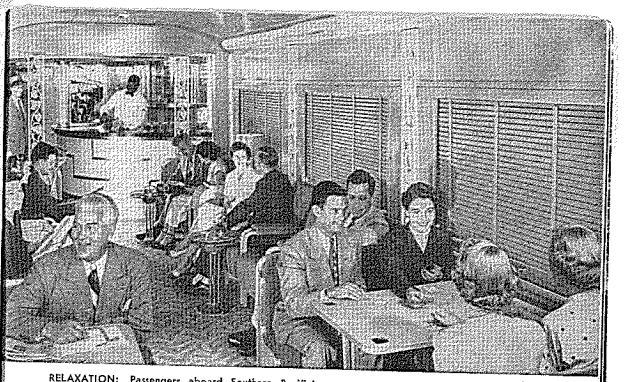
Teletypewriter circuits and machines connect all major Southern Pacific stations and terminals for prompt communications, and are also used in connection with the railroad's automatic business machine punched-card car reporting system, one of the most extensive systems of its kind in the country.

Southern Pacific was among the pioneers in the application of punched card methods to accounting and clerical operations, its use of punched card equipment starting in 1912. Through extensive use of punched card and other modern high-speed business machines in all major phases of its accounting and clerical operations, SP has made substantial reductions in the time and effort required to record the thousands of transactions that take place each day at the hundreds of places where the SP conducts business.

An example of this is the railroad's mechanized car reporting and information processing system, which involves the use of modern high-speed teletype,

BREATH-TAKING is the word for the streamlined "Shasta Daylight" and the scenery it offers. Here it is shown gliding south, at the base of towering Mount Shasta. This train was inaugurated July 10, 1949, cutting three hours off the former Portland-San Francisco schedule.





RELAXATION: Passengers aboard Southern Pacific's new post-war streamliners found train travel even more pleasant in new lounge cars, like the French Quarter lounge of the "Sunset Limited" illustrated here.

punched card and electronic equipment, which has been in operation since 1952. This system enables railroaders to plan switching movements in advance of train arrivals at terminals, resulting not only in better utilization of manpower and equipment and faster operations but also in earlier delivery of shipments. Twice-daily car movement reports sent to Southern Pacific traffic offices in principal cities enable the railroad to keep shippers and consignees currently informed about movement of shipments, a service that has been of special value to manufacturing and merchandising concerns for production planning and inventory control. The earlier receipt of train and car movement information, in a machine language form suitable for automatic processing on high-speed business machines, enables the Accounting Department to furnish more quickly and economically current facts regarding major aspects of the railroad's operations, adding value to the reports furnished.

The car reporting system used on the Southern Pacific is integrated with a similar system on the Union Pacific. Other major railroads were planning and installing these systems in 1955, which will make possible the coast-to-coast high-speed machine reporting of car and train movement information on an industry-wide integrated basis.

Additional units of high-speed automatic business machines are to be installed by SP in 1955 and 1956. These include electronic data-processing machines, which will automatically read, assemble and classify information recorded in punched cards, and—at speeds measured in thousandths of a second—perform a series of calculations, producing reports and records in minutes that would require hours by other means.

By mid-1955 microfilming had been expanded to additional locations. For example, waybills are photographed at terminals on receipt from connections so that certain paper work can be by-

DIESEL POWER in mid-1955 was handling 90 per cent of SP's freight volume, 87 per cent of the passenger train miles and 84 per cent of yard switching hours. Picture shows one of the powerful, efficient diesels pulling a freight train over the Sierra.

passed temporarily, permitting a freight train to depart as soon as it is made up. Following the train's departure, microfilm is used to prepare reports for distribution by mail or teletype. This procedure, together with punch-card reporting, has been an important factor in expediting the movement of trains. Microfilming is used extensively as a substitution for certain manually prepared station records.

Microfilming also was used for record and accounting purposes, and extensive use was also made of high-speed copying machines to make exact copies of letters or documents in a few seconds at a cost of only a few cents.

The use of simplified methods and effort-saving, high-speed business machines has aided and extended the natural talents and abilities of railroad office employes. They are relieved of tedious time-consuming tasks and their jobs are made more interesting.

Manual labor of many kinds also was mechanized, the time and effort-saving devices ranging from tie tampers and tunnel ballast cleaners (both of these designed in Southern Pacific's own shops), to mechanical carriers and stackers in the Stores Department. Mechanical washers cleaned diesel locomotives and whole passenger trains. Mobile cranes and lift trucks speeded the handling of freight at terminals, and there were some installations of endless belts and chains for such purposes and for the handling of mail and baggage. Powered machines did the cutting and drilling, the tightening of bolts—even far out on the line where hand work had ruled before.

Laying of heavier rail was a continuing postwar program involving expenditure of several millions of dollars annually. The track forces also continued the program of lengthening sidings and easing grades and curves, and

the strengthening of bridges for heavier, faster trains.

Detector cars cruised the tracks, searching for sub-surface flaws in the rails by electrical or magnetic means. Flame hardening of stock rails in switches doubles the life of such parts, reducing maintenance.

Construction was begun in 1947 and completed in 1952 on relocation of a portion of the Cascade line above Eugene, Oregon. The federal government built 23.2 miles of new line around Meridian dam and reservoir to replace the tracks SP was obliged to abandon because of construction of the dam.

Puente "By-pass Line"

Grading was started October 11, 1951, on a new 15.2-mile connection extending from Puente, on the Sunset Route in southern California, to a point near Studebaker. Construction of 8.6 miles of new track was involved, plus joint use with Union Pacific of 6.6 miles of existing track. First section of the new line was opened for traffic October 26, 1953, the entire project being placed in operation the following June. Cost was approximately $4,300,000. This new "by-pass line," so called because the cars using it can by-pass the busy Los Angeles Yard, is expediting the flow of a large volume of carload freight that moves to and from the Los Angeles area harbors and adjacent industrial districts.

Another route improvement project, the replacing of the Great Salt Lake trestle with a rock fill, was being given serious consideration by 1955, with engineering studies under way to determine its feasibility.

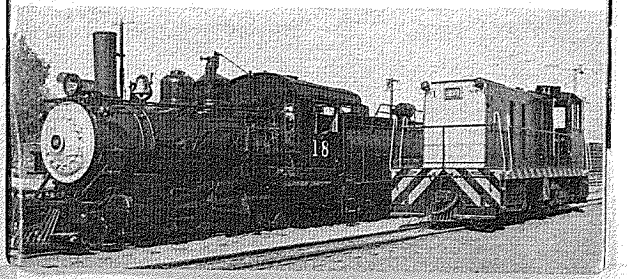
A depressed trainway carrying SP's main line tracks under eight major street crossings in El Paso was placed in service August 21, 1950, the more than $5,000,000 project being financed jointly by the city, state and the railroads involved.

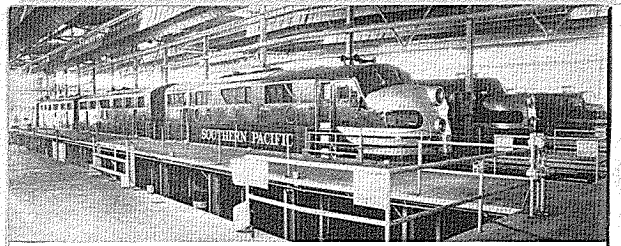
Considerable Centralized Traffic Control was installed on the SP system after 1951. Included was the 98-mile section between Klamath Falls and Crescent Lake, completed October 30, 1953; 95 miles between Crescent Lake and Eugene, completed October 26, 1954; and 32 miles between Harrisburg and Rosenburg, Texas, completed December 31, 1953. By the end of 1954 the System lines had a total of 700 miles of CTC installations, covering strategic trackage.

West Texas 1954 Flood

A mighty flood such as West Texas had never experienced brought death,

LAST RUN: Diesel power won out over steam on the Keeler-Laws narrow gauge branch in the Owens Valley on October 16, 1954, in an historical ceremony marking the retirement of locomotive No. 18. The 45-ton diesel was especially built for the narrow gauge Mojave Desert line.





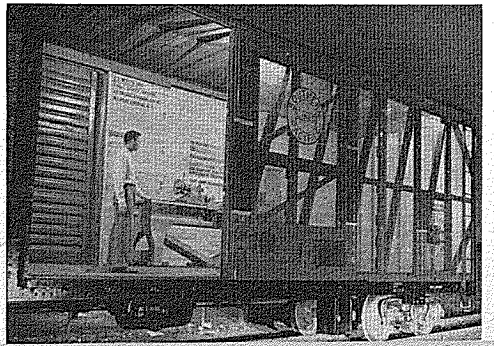
CHECKUP: Southern Pacific's diesel enginehouses like this one at Los Angeles have every facility needed for fast and economical servicing of diesel locomotives.

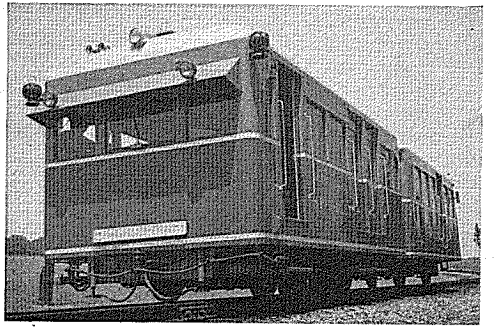
destruction and damage totaling millions of dollars to the area traversed by the Rio Grande, Pecos and Devil's rivers during the last week in June, 1954. The evacuation of some 200 passengers stranded aboard the "Sunset Limited" near Langtry was a striking example of how enterprising railroaders meet emergency situations.

Like a mad giant, the Devil's and Rio Grande rivers crushed rail and highway structures. While Southern Pacific sustained no injury or loss of life—either to its passengers or employes—it suffered heavy damages to its mainline between Del Rio and Sanderson, and to its Rio Grande bridge at Eagle Pass.

The devastation began with Hurricane Alice, the first tropical storm of the 1954 season, which struck the Mexican Gulf Coast near Brownsville on June 25. Alert SP section crews were quickly on

"TELAVUE" BOX CAR used by the Southern Pacific as part of intensive program to instruct railroaders in proper handling of freight shipments. Plexiglass side of car and mechanisms that register impact force permit quick study of effect on loads when car is coupled at various speeds to a locomotive or other cars. Door is open to show lathe that serves as a sample load.





SAFE RIDING: Electrical equipment in the rail detector car detects the presence of any rail flaws as it cruises along the lines. The defective rail is then marked for immediate removal.

the job. Shortly before midnight on June 26 the eastbound "Sunset Limited" was held at Langtry while track forces patrolled the right-of-way. Four miles east of Langtry a major washout was discovered 100 feet wide and 50 feet deep.

Plans to back the train out of Langtry were halted when two additional washouts were found. One of these, just west of Langtry, was 383 feet long and 50 feet deep. Another was 100 feet long and 50 feet deep.

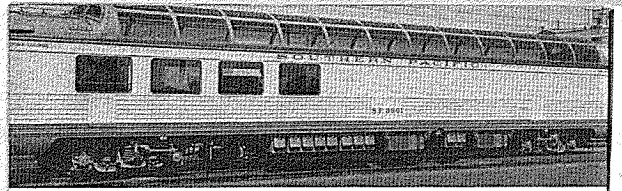
By daylight on Sunday, June 27, SP forces were mobilizing men and materials for round-the-clock operations. When it was determined chartered buses could not reach the scene and that commercial helicopters were not available to do the job, Pentagon officials were contacted and even before major line repairs could start, SP had the largest peacetime helicopter airlift in domestic history in operation.

Eighty-seven of the train's passengers had been evacuated by the "whirleybirds" when darkness halted operations on June 27. They left Del Rio by special train that same night. The airlift to Del Rio was resumed next day for the remaining passengers.

As a special precaution, SP had taken out a $500,000 policy covering each passenger while being transported by helicopter. Totaling $130 million, this short term insurance cost the railroad $1,370 —a minor item in the total picture, but an interesting sidelight in the railroad's concern for its passengers.

Mineral Survey

Early in 1955 SP organized an exploration program for metallic and nonmetallic minerals, other than oil and gas, to obtain a mineral inventory of its land ownership. The railroad's land department was expanded by the addition of ten technicians to assist in carrying on the survey program expected to re-



A SIDE VIEW of SP's Dome Lounge car illustrates the full-length of car's glass dome and the spacious window areas provided for upper and lower level passengers.

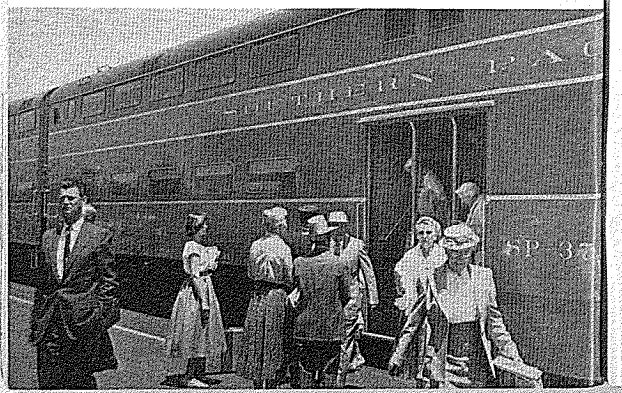
quire eight years. Continuous field work will be carried on by transferring operations to fit the varied climatic conditions in desert and mountain areas.

On December 31, 1954, Southern Pacific Transportation System and separately operated Solely Controlled Affiliates owned 4,036,776 acres of outlying land held for management purposes, 56,382 acres, and a part interest in 205 acres, of other land not used or held for use in railroad operations, and 4,924 town lots. In addition, the companies owned oil, gas and mineral rights, or royalty interests, in 1,203,474 acres, principally land which previously had been sold. The general policy is to hold the outlying lands and to manage them for continuing income.

Passenger Services

During the postwar period to end of 1954 a total of 261 new passenger cars of various types were placed in service. In the same period 34 diesel locomotives were placed in passenger train operation. Cost of this equipment was approximately $48,000,000. Most of the cars and locomotives were assigned to the new "Shasta Daylights," "Sunsets," "Cascades" and other trains as mentioned in previous chapter.

RIDING HIGH: New two-level commute coaches, which went into service on the San Francisco Peninsula in June, 1955, were built to seat 145 passengers. The cars, with automatic sliding doors at the center, were custom built to incorporate changes suggested by commuters.



HIGH-WIDE VISION: First experimental car of SP's new Dome Lounge fleet was turned out of the Sacramento shops in July, 1954. Following enthusiastic passenger response, six additional dome cars were ordered. The Dome Lounge cars went into daily service on the "San Francisco Overland" and "San Joaquin Daylight" in May, 1955, and on the "Shasta Daylight" in June, 1955. The interior furnishings of the cars are characterized by simplicity and follow the lanai motif popular on the Pacific Coast. Interior colors are shades of green, accented by the browns of teak and rattan. Cars are of two-level construction, with the dome extending over both sections, giving an effect of spaciousness never before achieved in a railroad car. The cars feature both observation and cocktail lounge facilities under a full-length dome.

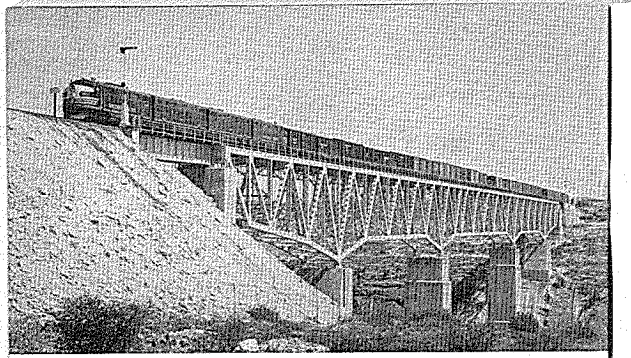
Not included with the above equipment were the 26 "Hamburger Grill" cars which were placed in operation early in 1955. These are used as an additional type of service on some trains or have replaced former dining services. The cars were converted in SP shops from either diners or coffee shop cars. They are designed for self-service, passengers making their selections at a glassed-in display counter. The menu features a special hamburger and provides a service more economical than customarily offered in diners or coffee shop cars.

Newest of SP's passenger equipment are seven Dome Lounge cars and ten double-deck coaches. The latter 85-foot cars were scheduled for operation in the early summer of 1955 on commute trains between San Francisco and San Jose. They have capacity for 145 persons as compared with seats for 96 on largest of the commute train coaches.

Distinctive Dome Lounge

The dome lounge cars were converted at Sacramento Shops in 1954-55. They are of the railroad's own design and introduced an entirely new concept for such equipment. Seats are on two levels but no seat is under another. All seats are covered by the huge dome. First experimental car was turned out of the shops in July, 1954, for test runs to determine passenger reaction and what revisions should be made in design. First of the new domes were in service by May, 1955, and all were in operation before the summer season that year.

First deliveries of 25 new streamlined chair cars were made in March, 1954. These were added to various trains to meet the increased demand for low-cost



FAST AND HIGH: A diesel freight cruises across the spectacular 1,390-foot long Pecos River Bridge, between Sanderson and Del Rio, Texas. The original 326-foot high span, opened in 1892, was replaced by this steel cantilever bridge in December, 1944.

transportation. Seats in the new cars were specially designed for comfort of overnight travelers.

By mid-1955 all of the Company's streamlined passenger trains were diesel powered, except for the Oakland-Bakersfield portion of the "San Joaquin Daylight" San Francisco-Los Angeles run.

Continuing the policy of eliminating passenger trains that do not attract sufficient business to pay out-of-pocket costs, many secondary trains were discontinued. By mid-1955 there was a total annual saving of 5,820,818 passenger train-miles through the train services discontinued since 1946.

Among long distance passenger services discontinued were: SF-Portland "Oregonian," November 14, 1946; Sacramento-Portland "West Coast," October 2, 1949; SF-Ogden "Gold Coast" and LA-Tucumcari mail-express train, January 9, 1955.

The "Starlight" was established on the SF-LA overnight Coast run October 2, 1949, on which date both the "Noon Daylight" and the "Coaster" were taken out of service. When the "Shasta Daylight" went into service July 10, 1949, on the SF-Portland run, the "Beaver" was discontinued, it having been in service since June 8, 1940.

The railroad's passenger sales organization has been streamlined in many ways to give customers better service and to trim costs. Important in this connection are the Central Travel Service Agency units of the Passenger Department at Los Angeles and San Francisco, where the telephone has a principal role in the selling technique. In these new type CTSA ticket offices the customer is first directed to a specially arranged telephone booth. Seated there he dials a CTSA representative and when the ticket order is placed he takes a seat in a comfortably appointed lounge to await makeup of the ticket instead of standing at a counter. When the ticket is ready he is paged over the public address and steps to the counter where a salesman or saleswoman is waiting to complete the transaction. The Los Angeles CTSA office was opened September 15, 1952, and the San Francisco office on September 12, 1954.

The $16,000,000 New Orleans Union Passenger Terminal, used by the eight railroads serving that city, was formally dedicated May 1, 1954.

Traffic Volume

Freight traffic reached an all-time high in 1952, a total of more than 41 billion ton-miles, a billion ton-miles above the previous high record of the war year 1944.

From this peak, induced in part by the Korean crisis, the traffic began to fall off in 1953, after the Korean truce was signed in July that year.

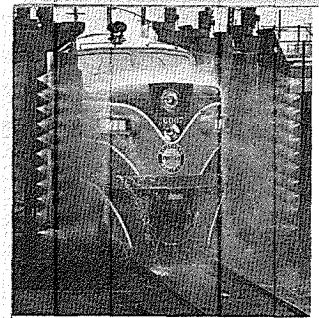
The decline in traffic continued through the early months of 1954, reflecting the adjustment of business activity to a peacetime basis. As business became stabilized in the summer and fall of that year, railroad freight traffic reacted in a like manner. A definite upturn in freight volume commenced in the closing months of 1954.

Although passenger traffic decreased from World War II peaks, passenger business in 1954 was at a higher level than in the years just before the war. The number of passengers carried in 1954 was 31.1 per cent greater than in 1940 and the business was handled with 17.4 per cent less train-miles than in 1940.

Largest job of pruning off losing services was the sale of the Southern Pacific of Mexico, effective December 21, 1951, after extended negotiations. The property had operated at a loss every year since 1926, with exception of 1928-30 and 1942-43. The Mexican Government purchased the physical properties for $12,000,000 U.S. currency, of which $3,000,000 was paid in cash and $9,000,000 in Mexican Government bonds. It is now operated as the Ferrocaril del Pacifico.

On August 8, 1952, Southern Pacific Company issued to stockholders one additional share of capital stock for each share then outstanding, thus effecting a two-for-one stock split. At the end of 1954 there were 9,047,122 shares of capital stock of Southern Pacific Company issued and outstanding. There were 61,311 stockholders at the end of the year, greatest number in the company's history, with approximately 80 per cent owning 100 shares or less and about 12 per cent holding 10 shares or less. The number of stockholders was nearing the

PIONEER IN TRAILER-FLATCAR OPERATIONS in the West, Southern Pacific introduced a "new look" for its trailers as it extended "piggyback" service in late 1954 and early 1955.



TO THE SHOWERS: The cleaning of passenger cars and passenger and freight locomotives has been speeded by the use of mechanical *washers, such as this one at West Oakland.*

63,000 mark by mid-1955. SP's securities also are held by many insurance companies representing millions of policy holders.

From the end of World War II to the close of 1954 (about 9½ years) a total of $655,000,000 was spent on properties of SP and solely controlled affiliates for capital account work. This was an aver*age of about $70,000,000 a year. The* principal expenditures were for new equipment, including 1,363 units of diesel power, 40,420 freight cars, 180 cabooses and 261 passenger-train cars, with a cost of $465,000,000. The remaining outlays were generally for additions and betterments to roadway property, improvements to existing rolling stock, new trucking equipment, etc.

For the year 1955 a record breaking *expenditure of $115,000,000* on capital account work was planned, including about $54,000,000 for purchase and construction of new equipment, including 153 diesel locomotive units, 3,061 freight cars and 10 double deck passenger cars. About $31,000,000 was slated for improvements to roadway property and existing rolling stock, new trucking equipment, etc., and $30,000,000 for the construction of pipe lines from the Los Angeles and El Paso petroleum refinery areas to Phoenix and Tucson.

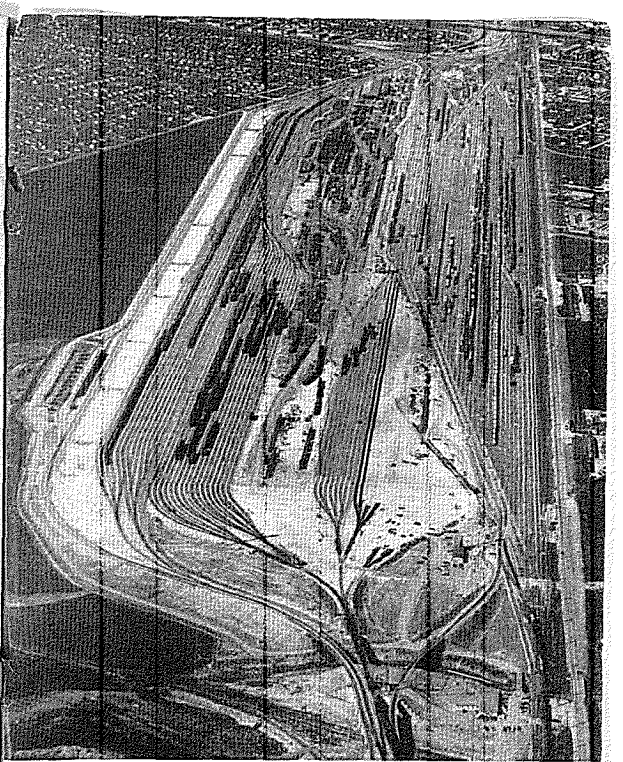
To construct and operate the pipe lines, a new company was incorporated February 18, 1955, under the name of Southern Pacific Pipe Lines, Inc. President Russell announced this was in keeping with Southern Pacific's aim to furnish a complete land transportation service to shippers. Construction on the 800-mile pipe lines began the following May. They were scheduled to be in operation by the end of 1955 to carry regular, premium and aviation gasolines, diesel oil and jet fuel.

With total assets of $1,985,711,980 at the end of 1954 Southern Pacific Transportation System ranked eighth among the leading corporations of the country, excluding banks and insurance companies. With total operating revenues of $626,214,435 in 1954, Southern Pacific Transportation System was third highest among the U.S. railroads, and *in freight revenue it was second only* to the Pennsy.

At end of 1954 there were more than 75,000 men and women on SP's Transportation System payrolls, and some 6,000 employed by the solely controlled affiliated companies.

Southern Pacific is looking far ahead. It has an organized, long-range planning program under which all departments, individually and in collaboration with one another, are continually seeking to improve the railroad plant, its efficiency and its service.

As the railroad observed the centennial of its first western line, it was performing transportation services more efficiently than ever before, with a plant modernized to take care of the spectacular growth in its western and southwestern areas.



YARD PROGRESS: Radar and an "electronic brain" practically replace pushbuttons at the new Englewood Yard at Houston, making it one of nation's most highly modernized yards. This aerial view was taken in April, 1955. The yard was scheduled to be placed in complete *operation by end of that year.*

The Southern Pacific Tradition

TODAY, the men and women of Southern Pacific—out on line, in shops, offices and in all phases of operations—are continuing the pioneer tradition of resourceful railroading and public service established by the company's founders.

D. J. Russell, president, has declared:

"We are grateful to those early pioneers who built so soundly and placed in our care a great railroad system. It is our privilege to carry on in a broad gauge way so that we may leave a still better heritage to those who come after us."

Steel rails of the Southern Pacific now join the West and Southwest in an eight-state "Golden Empire," a region of unprecedented industrial, agricultural and population growth.

The old frontiers are no more, but it is to the continued growth and development of this amazing region that SP's men and women are now dedicated.

New technological developments already are permitting great new strides.

"We live in an exciting present," President Russell points out, "and we face a future that is full of promise for each of us and for our railroad."